MARCH, 1957

TRAFFIC ENGINEERING

- Accuracy of the Volume-Density Method of Measuring Travel Time
- A Simultaneous vs. Triple Alternate Signal System
- Off-Street Parking Developments
- Modification of Fixed Time Traffic Signal Controller to Give Semi-Actuated Operation

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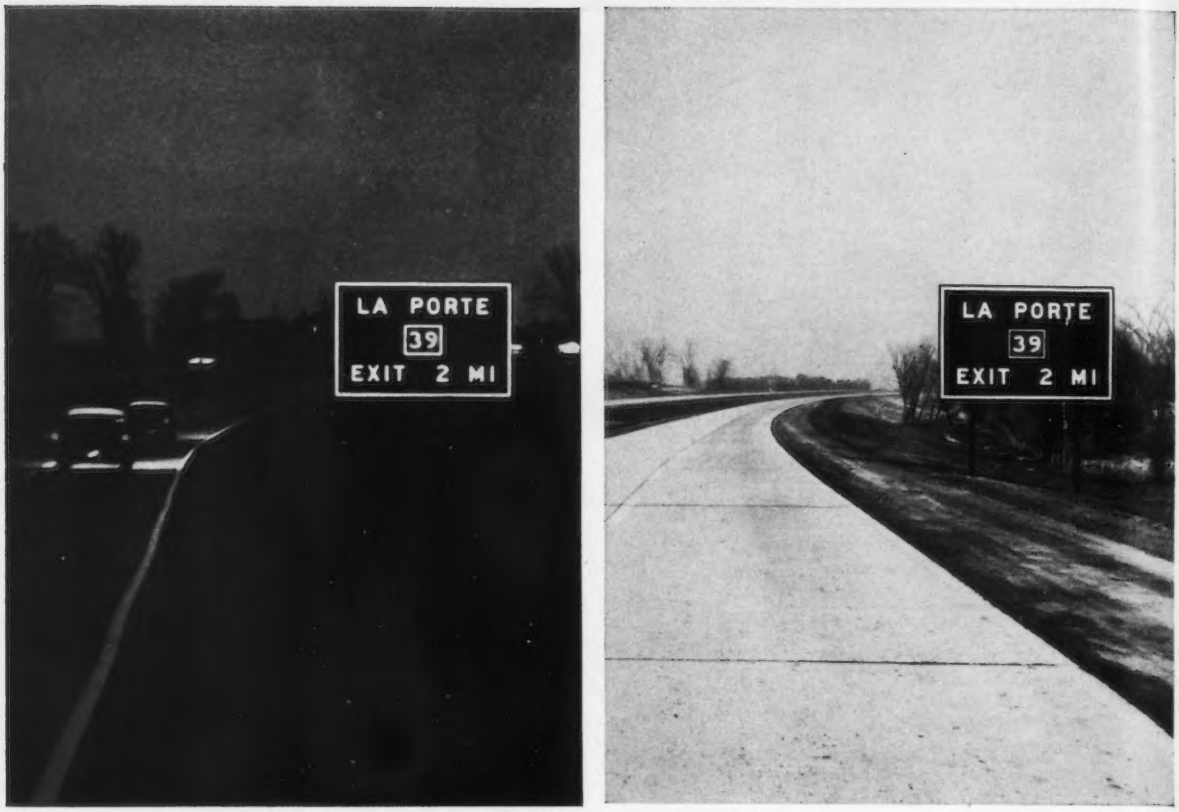

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TRAFFIC ENGINEERING

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Vol. 27 MARCH, 1957 Number 6

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COVER: Connecticut Turnpike at New Haven, showing connections with city streets and state highways. Photo from Connecticut State Highway Department.

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Frankly Speaking . . .

ONE OF THE COUNTRY'S better known traffic engineering consultants was recently quoted in a newspaper feature as saying that traffic engineering had fallen far short of the goals it had set for itself twenty-five years ago.

The publication of this statement resulted in the charge that a traffic engineer was indicting his own profession — a charge which the original author vigorously denies. His defense is so earnest — his arguments so compelling — that they are worth repeating. Says he:

"Too many businessmen and government officials consider that the traffic engineering function consists of nothing more than signs, signals and markings. Therefore they are content to assign the job to personnel which is technically unqualified to meet the broader responsibilities in traffic and transportation. They are content with inadequate staffs and budgets because they don't recognize the potential services that a true traffic-transportation engineering group could perform. In too many places the traffic engineer is saddled with so much routine detail that he never has an opportunity to contribute to the broader picture. He has neither the staff nor the budget to bring traffic engineering to the status in his locality that it deserves."

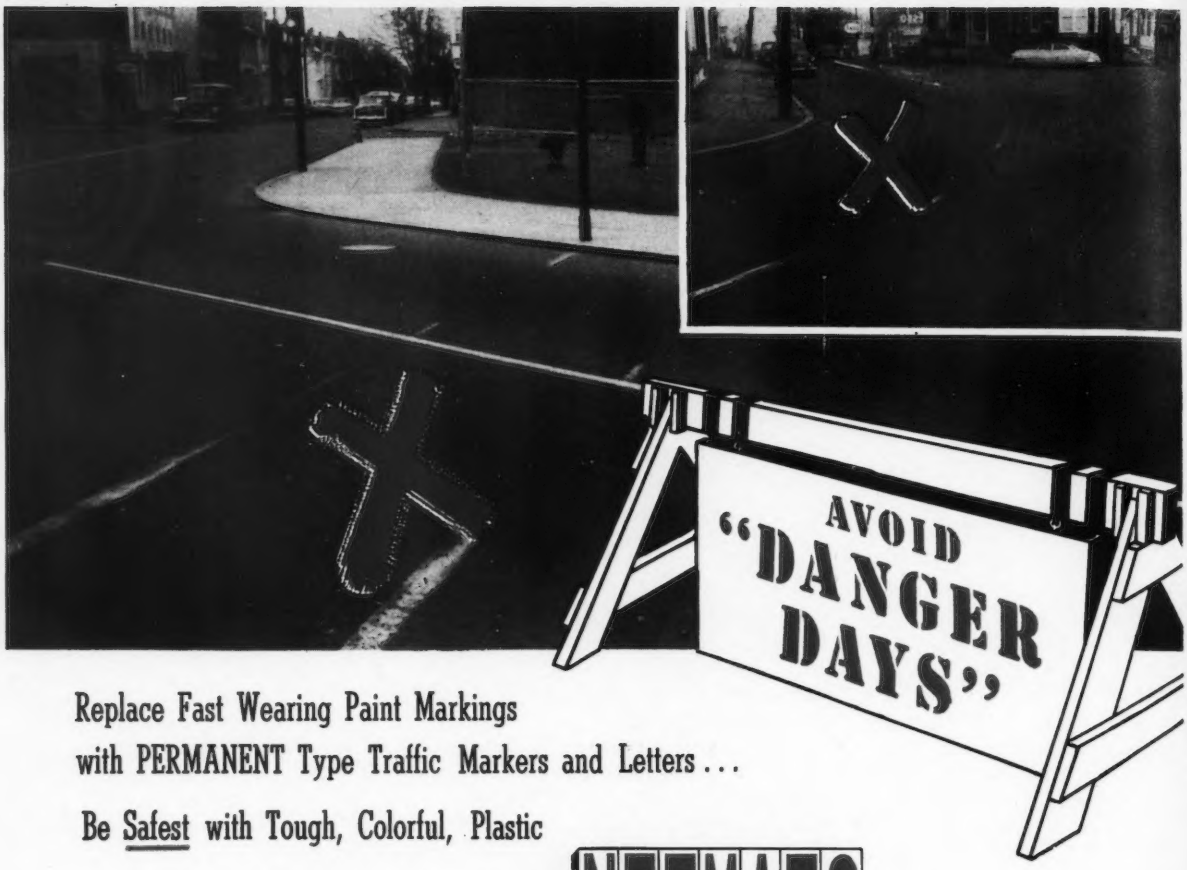
He goes on to point out that in the past ten years a great number of communities have for the first time employed traffic engineers or have begun to expand an existing staff. He reminds us that on the state level traffic engineering has contributd much to research and development, but that even so we have a long way to go before we are doing the job that needs to be done, particularly in urban areas.

This charge cannot be taken lightly, whether it is regarded as an indictment of the profession or of those outside the profession who have not granted it the status we feel it deserves. In any case, the profession needs to search its collective soul to determine what it might have done differently to achieve a better status in 1957.

If this self-appraisal develops any short-comings, they should serve as markers for our program for the years ahead. If we have made mistakes, either sins of commission or of omission, let's profit by them to help bring the profession up where it belongs and where we predicted twenty-five years ago it would be by now.

Undoubtedly there have been mistakes during the years. Some of them are very obvious — we haven't always set our sights high enough in the matter of standards for membership in the profession — we have relied too much on pragmatic solution of our problems (in the course of so doing we sometimes tried the wrong thing and got into trouble) — and we certainly have had about as poor a public relations program as it was possible to have.

Despite all this, we have come a long way and we can be very proud of our accomplishments. Let us all at the same time acknowledge that we have a long way yet to go, and do something about it.



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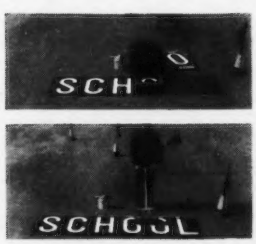

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Accuracy of the Volume-Density Method of Measuring Travel Time

By David Solomon
(Jun. Mem., ITE)
Highway Transport Research Engineer
Bureau of Public Roads

EDITOR'S NOTE: *This article constitutes a portion of a thesis submitted to the Bureau of Highway Traffic, Yale University.*

DETERMINING the effectiveness of traffic control measures at intersections is important from both an operational and a research point of view. Measurement of stopped delay has frequently been used for this comparison.

Measurements of stopped delay, however, may not afford satisfactory comparisons if deceleration patterns at the intersections are not the same. This may be the case if different types of signalized intersections are studied; and especially if one of the intersections is controlled by stop or yield signs, or is uncontrolled. For these conditions, the intersections should be compared by using measurements of travel time rather than measurements of stopped delay.

The purpose of this article is to indicate the accuracy of a simple, inexpensive method of measuring travel time at approaches to intersections. A pencil and paper, an ordinary watch, and one or more observers are required to collect the data. Only two man-hours are needed to determine travel time on one approach to an intersection for one hour, including both field work and office computations. If hand counters are added to the equipment, total work time is reduced to 1.2 man-hours for each hour of data obtained at each intersection approach.

A discussion of the advantages and limitations of the method will be included as well as an example of its practical application. First, however, the method will be described briefly.

Description of the Method

Suppose that it is necessary to measure the average travel time for all vehicles traversing an intersection approach — perhaps 500 feet long — during a given time period such as 10 minutes. To do this, the number of vehicles occupying the section under study are counted at successive time intervals such as 15 seconds. Each count is thus the density at that instant. During the given time period, such as 10 minutes, a number of these instantaneous density counts are made and totalled. This total is called total density. The number of cars leaving the section are also counted during the time period, and this is known as volume. The average travel time, T, may then be calculated as follows:

$$T = \frac{Nt}{V}$$

Where:
T = average travel time in seconds
N = total density in vehicles
t = interval in seconds between successive density counts
V = volume in vehicles

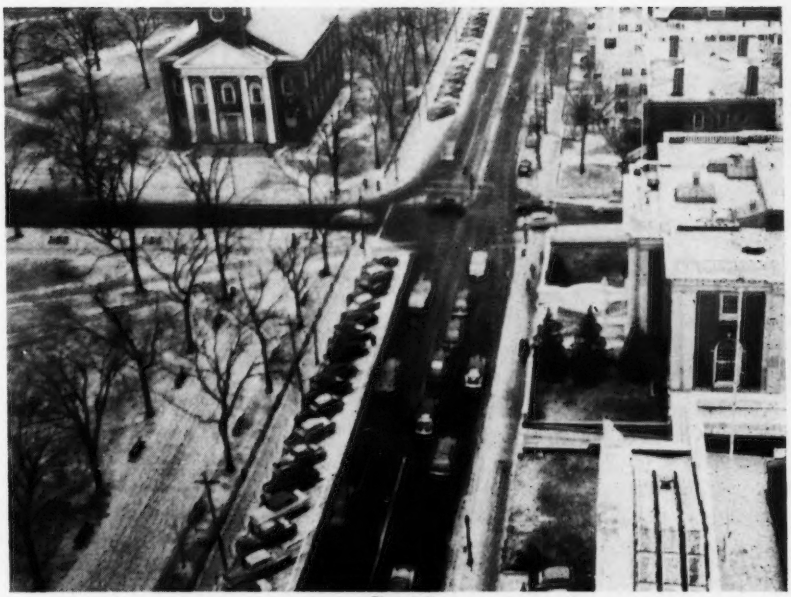

Figure 1.
This New Haven intersection was used to determine the accuracy of the volume-density method.

Accuracy of the Volume-Density Method

Two approaches to a signalized intersection in New Haven, Connecticut, were selected in order to determine the accuracy of the method. A view of the intersection is shown in Figure 1 looking west along Elm Street. Both the east and west approaches were included in the study. The one-way north approach along Temple Street was omitted because several buildings obstructed the view of this approach. An observer counted density at 15-second intervals, while pictures of the intersection were taken at 1-second intervals by employing a motion picture camera. The pictures were later used to count the volume as well as to measure the "true" travel time. Travel time was also computed from the man-

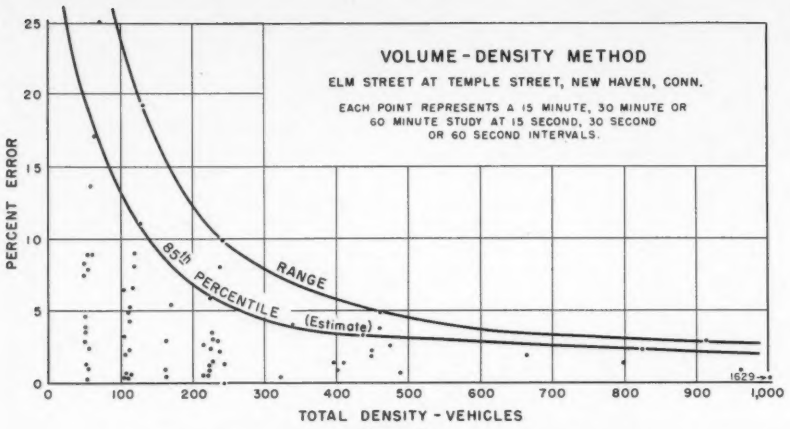

Figure 2.
Variation of error in determining travel time with total density.

ual density count, using the volume determined from the pictures. These two travel times were compared and the percent error plotted in Figure 2 for various combinations of time period (15, 30, and 60 minutes) and time interval (15, 30, and 60 seconds).

The accuracy determination, therefore, applies to a condition where the volume count is assumed to be exact and the error is due to the count of total density.

As Figure 2 shows, the error in determining travel time drops rapidly as total density increases. When all the data were combined, the error was less than one percent, showing that there was no consistent positive or negative bias in the results obtained. No apparent relation was evident between percentage error and different volumes, provided total density was the same.

Table 1 gives the required time interval between density counts for errors of 5 percent and 10 percent. This table was constructed as follows: First, the equation, $T = \frac{Nt}{V}$ was transposed into the form $t = \frac{TV}{N}$. The total density N was then taken from the 85 percentile curve of Figure 2 for errors of 5 percent and 10 percent. Several common combinations of volume (V) and travel time (T) were selected and finally the equation was solved for the required time interval (t). It may be seen from the table that travel times accurate to within 10 percent will be produced nearly all the time if a time interval of 15 seconds is used.

TABLE 1 — Time Interval Required for Determining Average Travel Time During a 15-minute Time Period Within an Accuracy of 5 Percent and 10 Percent

15-minute volume	Travel time	Time interval for 5 percent error 1/	Time interval for 10 percent error 1/
vehicles (V)	sec. (T)	sec. (t)	sec. (t)
50	20	4	7
	40	8	14
	60	11	21
100	20	8	14
	40	15	29
	60	23	43
200	20	15	29
	40	30	57
	60	45	86
400	20	30	57
	40	60	114
	60	91	171

1/ This degree of error or less will result in about 85 percent of the cases if the time interval between density counts is as shown in the table.

Application of the Method at Several Intersections

The volume-density method was used at three other New Haven intersections in order to determine the effect of parked vehicles on travel time. The study showed that travel time was reduced when curb parking was removed at all intersections studied and at all volumes. Volumes varied from less than one-fourth of possible capacity to near capacity.

At one intersection approach in particular, where signal coordination barely permitted progressive movement, the benefit from removal of parking was enormous. This approach is shown on the right in Figure 3. When the approach was operating at two-thirds of its possible capacity, for example, 19 minutes of delay accrued to all moving traffic for each hour that each parking space was in use.

Advantages of the Method

1. If a volume count is in progress at an intersection, only two more men are needed in order to determine travel times. Each additional observer counts density on two approaches while the existing observers continue the volume count.

2. Very little equipment is required. Pencil, pad, and watch with second hand are sufficient, although hand counters are a useful addition.

3. Office summarization of data is kept to a minimum, especially when hand counters are used.

4. Travel time for any reasonable distance before or after an intersection may be determined. It is estimated that 800 feet is the maximum practical distance, but this depends upon the height and position of the observers, the number of lanes of traffic and upon other peculiarities of a particular intersection. Longer sections can be subdivided and studied separately.

5. Travel time rather than stopped delay is measured. Stopped delay may be determined, if needed, by including only stopped vehicles in the density count.

(Continued on page 288)

A Simultaneous vs. Triple Alternate Signal System

by

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Figure 1
Broad Street in downtown Richmond, Virginia, looking west.

BROAD STREET is the major east-west artery extending through the central business district of Richmond, Virginia. The thoroughfare is approximately 86 feet wide from curb to curb with a 4 foot concrete median.

Overhead mast arm signals exist at each intersection with dual intersections and "Walk-Don't Walk" indications. From 7 to 9 A.M. and from 4 to 6 P.M. the system works on an 80 second cycle and a 70 second cycle at other times. The exclusive Pedestrian "Walk-Phase" consists of 22 seconds, 16 seconds of "Walk" and 6 seconds of "Don't Walk" clearance.

No vehicle traffic can legally move during the 22 second pedestrian period and no pedestrian can legally conflict with vehicles during the remaining vehicular phase.

During the months of July and August 1956, the city of Richmond and the Traffic and Planning Division of the Virginia Department of Highways, undertook a joint study of the relative merits of a simultaneous traffic signal system as opposed to the then existing triple alternate signal system on Broad Street.

The study area of Broad Street included that section lying between College and Adams Streets.

TABLE I

Average 24 Hour Traffic Volumes

Counter Location	Direction	Before*	After*
Broad St. between First and Adams Sts.	WB	11,674	11,262
Broad St. between Foushee to First St.	EB	9,733	9,387
Broad St. between Second and Third Sts.	WB	11,760	11,039
Broad St. between Third and Fourth Sts.	EB	11,193	10,909
Broad St. between Third and Fourth Sts.	WB	13,379	12,102
Broad St. between 5th and 7th Sts.	WB	12,082	11,994
Broad St. between 6th and 7th Sts.	EB	10,513	10,654
Broad St. between 7th and 9th Sts.	WB	12,655	11,959
Broad St. between 8th and 9th Sts.	EB	10,537	10,531
Broad St. between 9th and 10th Sts.	WB	10,964	11,098
Broad St. between 10th and 11th Sts.	EB	10,646	10,751
Broad St. between 12th and College Sts.	WB	9,784	10,698
Broad St. between 12th and College Sts.	EB	11,115	9,410
Adams St. between Broad and Marshall Sts.	NB	1,810	1,996
Adams St. between Broad and Marshall Sts.	SB	4,525	3,664
Adams St. between Broad and Grace Sts.	NB	2,820	2,715
Adams St. between Broad and Grace Sts.	SB	2,836	2,622
Foushee St. between Broad and Grace Sts.	NB	743	799
Foushee St. between Broad and Grace Sts.	SB	623	644
First St. between Broad and Grace Sts.	NB	5,333	4,696
Second St. between Broad and Marshall Sts.	SB	6,740	7,053
Third St. between Broad and Grace Sts.	NB	6,475	5,860
Fourth St. between Broad and Marshall Sts.	SB	4,305	3,748
Fifth St. between Broad and Grace Sts.	NB	6,173	3,873
Sixth St. between Broad and Marshall Sts.	SB	4,828	4,538
Seventh St. between Broad and Grace Sts.	NB	4,854	5,451
Eighth St. between Broad and Marshall Sts.	SB	6,198	4,145
Ninth St. between Broad and Grace Sts.	NB	4,537	4,784
Tenth St. between Broad and Marshall Sts.	SB	5,964	5,720
Eleventh St. between Broad and Capitol Sts.	NB	2,578	2,273
Twelfth St. between Broad and Marshall Sts.	NB	4,184	3,970
Twelfth St. between Broad and Marshall Sts.	SB	3,795	3,081
Twelfth St. between Broad and Capitol Sts.	NB	3,697	3,695
Twelfth St. between Broad and Capitol Sts.	SB	4,558	4,597
College St. between Broad and Marshall Sts.	NB	1,342	1,374
College St. between Broad and Marshall Sts.	SB	1,901	1,788
Fourteenth St. between Broad and Grace Sts.	NB	2,616	2,738
Fourteenth St. Between Broad and Grace Sts.	SB	2,477	2,501

Before*—Period, July 23 to 27—Triple Alternate System.
After* —Period, August 6 to 10—Simultaneous System.
NB—Northbound SB—Southbound EB—Eastbound WB—Westbound

The study plan embraced time and distance runs on Broad Street between terminal intersections, wherein a test vehicle manned by State and City engineers, floating with traffic but not exceeding the legal speed limit of 25 MPH, made as many runs as possible between 7:00 A.M. and 6:00 P.M. for five days — Monday through Friday. These runs were separated into east and westbound trips during which, the actual number of stops required by traffic signals was noted. Hourly traffic volume counters were also placed at 29 locations on Broad and intersecting streets.

During the period July 23 to July 27, the triple alternate system was tested. The period July 28 to August 5 was used to change over to the simultaenous system, allowing a week for motorists to become familiar with it. From August 6 to August 10 the simultaneous system was tested.

City of Richmond personnel introduced a new factor into the study during the week of August 6, by adding a separate left turn phase to the traffic signal at 12th and Broad Streets. Comparable conditions before and after the signal system change over, therefore, did not exist for the entire study area length on Broad Street. For this reason this report considers the study area to lie between 11th and Adams Streets. Some of the results of the left turn phase at 12th and Broad Streets will be discussed later in the report.

This report is limited to a summation of pertinent data and brief conclusion since the tables are self-explanatory. All references to "before" relate to data collected and conditions existing under the triple alternate signal system and "after" to those under the simultaneous signal system.

There were no significant changes in traffic volumes on Broad Street or intersecting streets, between the two weeks of study. It is interesting, however, that in most locations on Broad Street, westbound volumes were higher than eastbound volumes. See Table I.

Of all the side streets emptying their traffic volumes into and across Broad Street, Foushee Street averaged the least — approximately 800 vehicles daily, and 2nd Street the most — approximately 7,000 vehicles daily. Third, 5th, 8th and 10th Streets averaged from 6,000 to 6,500 daily. Total traffic volumes from all side streets,

(Continued on page 271)

Figure 2
A typical signalized downtown Broad Street intersection in Richmond, Virginia.

TABLE II

Speed - Time - Delay

Broad Street:	Morning Peak 7 A.M. to 9 A.M.		Off-Peak 10 A.M. to 3 P.M.		Afternoon Peak 4 P.M. to 6 P.M.	
	Before	After	Before	After	Before	After
Eastbound						
Average Speeds in MPH	9.2	12.4	10.4	10.8	7.4	10.7
*Average Driving Time in Seconds	290	215	256	247	360	249
Average Number of Stops for Signals	5.3	2.7	4.6	3.3	7.3	3.0
Westbound						
Average Speeds in MPH	9.0	11.3	13.5	10.7	7.7	12.1
*Average Driving Time in Seconds	297	236	198	249	346	221
Average Number of Stops for Signals	4.6	2.9	2.5	3.2	6.7	2.9

Note: Before—Period July 23 to 27—Triple Alternate System.
After—Period August 6 to 10—Simultaneous System.
*Study length of Broad Street — Adams to 11th Street.

TABLE III

Speed - Time

Broad Street:	Morning Peak 7 A.M. to 9 A.M.		Off-Peak 10 A.M. to 3 P.M.		Afternoon Peak 4 P.M. to 6 P.M.	
	Before	After	Before	After	Before	After
Eastbound (11th to 12th Sts.)						
Speed in MPH	4.5	3.9	3.8	3.7	2.9	3.3
Time in Seconds	45	52	54	55	70	61
Westbound (College to 12th Sts.)						
Speed in MPH	11.0	5.6	12.5	7.2	11.0	4.1
Time in Seconds	33	65	29	50	33	89

Off-Street Parking Developments

Summarized from News Reports

NEW DEVELOPMENTS affecting the financing, construction and operation of off-street parking facilities, and related matters, as reported from state capitals and municipalities throughout the country, include the following:

Alabama

Enactment of state enabling legislation to permit Alabama municipalities to issue revenue bonds to finance off-street parking facilities was urged by Ed. E. Reid, executive director of the Alabama League of Municipalities.

He told the State Legislative Interim Committee on Municipal Government that "many towns and cities would build off-street parking lots if they could finance them by revenue bonds payable out of receipts from parking fees."

Reid said existing Alabama laws make this impossible and cities do not feel alternative financing is practical.

The legislative interim committee, which was asked to study the matter, is scheduled to submit its recommendations in May to the 1957 Alabama legislature.

Colorado

Enactment of Colorado legislation authorizing the state to acquire off-street parking facilities to serve the state capitol buildings area in Denver was recommended by the State Planning Commission in its annual report.

Delaware

Wilmington Parking Authority disclosed it would ask the Wilmington City Council to make $1,500,000 available for the purchase of five off-street parking areas that would have 628 spaces on a surface basis.

It was estimated that amount would take care not only of the purchase of the five areas but also for razing properties, surfacing the areas, and getting them ready for surface parking, pending further development.

The authority's proposed program was based on recommendations by the engineering firm of Wilbur Smith and Associates.

Meanwhile, construction was scheduled to start during the first week in January on the authority's multi-level parking building at Ninth and Shipley Sts. Construction of this project will cost $1,288,000.

Georgia

Five different agencies are working on the problem of what to do about traffic in the central business area of Atlanta when the downtown connector of the city's expressway system is completed.

Robert C. Stuart, director of the Metropolitan Planning Commission, said means are being sought to permit motorists coming off the expressway ramps to park inexpensively in fringe parking areas where they would pick up shuttle buses.

Involved in the study of fringe parking problems, in addition to the commission, are the Atlanta Traffic Engineering Department, the Atlanta-Fulton County Joint Planning Board, the Atlanta Traffic and Safety Council, and the Atlanta Transit Co. Burton H. Sexton, transportation consultant from Washington, was called in for liaison work on the study.

Stuart predicted specific recommendations would be forthcoming by the end of January.

City Traffic Engineer Karl A. Bevins explained one of the main problems involves determining how many vehicles will be coming off the expressway and where they will leave. An estimate also is needed on how many vehicles will be all-day parkers.

Bevins and Stuart both emphasized that the philosophy of the study involves continuance of off-street parking operated only by private enterprise.

Indiana

A bill to permit first class cities to pledge revenues from on-street parking meters as additional security on bonds sold to finance off-street parking facilities was introduced in the Indiana legislature by Senators J. Russell Townsend Jr. and John C. Ruckelshaus, both Indianapolis Republicans.

Indiana cities of second, third and fourth class already have such authority under past legislation.

Luther J. Shirley, chairman of the Indianapolis Off-Street Parking Authority, said the new measure would pave the way for the construction of a 550-car garage on the southwest corner of Illinois and Maryland Sts., Indianapolis.

"In today's tight bond market it's sure what we need," Shirley said, adding that it would be "awfully tough to sell bonds for the garage unless the bill passes."

The proposed $700,000 Indianapolis parking structure is scheduled for completion by Thanksgiving of this year in order to alleviate Christmas parking problems.

Explaining that the purpose of the bill is not to deplete the city's parking meter fund, Shirley said that such revenues would be used only as a last resort. "It's just that bond buyers demand this additional security," he said.

Indianapolis receives about $300,000 annually from parking meters.

Land at the building site for the Indianapolis garage already has been purchased and contracts were awarded last year.

Iowa

Council Bluffs city officials are planning a multi-level parking garage and have optioned for the purchase of most of the property for the facility, expected ultimately to cost nearly $250,000.

The building, which will be a half-block deep, will be located along the west side of Fourth St. Present plans fall for a concrete structure of two levels. City traffic officials said the building will have parking meters and will accommodate several hundred autos.

The project would be financed by revenue bonds, to be retired from parking meter receipts.

Kansas

Although business at Topeka's new ramp parking garage is starting to show a gradual uptrend, City Finance Commissioner Frank J. Warren said monthly receipts would have to increase still more if cost of operation and payment on bond principal and interest are to be met without digging into the city's on-street parking meter fund.

Warren said daily receipts for November totaled $5,100.30, compared with $5,275 for October. Receipts for September were $2,904.20. He said the garage netted $2,175.84 in November after paying salaries and operating expenses. This net gain goes into a fund for payment of bond principal and interest.

The city paid $71,304.02 in November on bond principal and interest, Warren said. Of this amount, $14,799.-.30 came from the parking garage-parking lot fund and the remainder was paid from the parking meter fund.

Construction of the city garage and parking lot was financed through a $1,200,000 revenue bond issue.

Maine

A proposal for the creation of a Portland Parking Authority, to attempt to finance the construction of off-street parking facilities on a self-liquidating basis, was made by Philip F. Chapman Jr., a Portland attorney.

He said that if the Portland City Council went along with the proposal, state enabling legislation would be sought. Such legislation, he added, would be subject to referendum approval by Portland voters.

Under the plan, the authority could lease out to private operators any lot it might acquire, or operate the lot itself. The authority would be required to stand on its own feet financially, without using any pledge of the city's credit. Projects would be financed by revenue bonds payable only from project revenues.

Meanwhile, James C. Saunders, president of the Greater Portland Chamber of Commerce, named a five member parking and traffic committee. Saunders said that the new committee, which will act as a clearing house for information on the problem, would study the proposal for a parking authority.

The proposal was immediately assailed by Victor A. Schlich, executive secretary of the Portland Parking Association, who termed it a "slap in the face for nearly 6,000 Portlanders who resoundingly trounced a proposal for municipal parking only two months ago."

"It's a bold attempt to ignore the wishes of voters who overwhelmingly expressed their faith in private enterprise and its ability to come up with a workable solution for Portland's parking problem," Schlich asserted.

Maryland

A resolution introduced in the Baltimore City Council proposed a study of the operation and rates charged in parking garages and lots built with city loans.

Suggesting that the survey be supervised by the City Board of Estimates the resolution further urged that consideration be given to adopting a uniform code of fair trade practices and consumers' protection to be administered by the City Off-Street Parking Commission.

Councilman Henry R. Hergenroeder, one of the sponsors of the resolution, said he had received complaints on high rates, scratched cars and questionable trade practices in some of the city-aided garages. He pointed out that the Off-Street Parking Commission now has power only to expedite and assist in the construction of new parking facilities.

He said the proposed study could determine whether the commission should also be empowered to regulate, supervise and fix rates for the garages after they are built with the help of city money.

Massachusetts

A bill filed for consideration by the 1957 Massachusetts legislature would permit municipalities to use parking meter receipts for any purpose for which other revenue may be used. The measure was offered by Rep. Richard L. Hull, Rockport Republican.

In another development, the Boston City Council adopted an ordinance boosting city license fees for parking operators. Those who had been paying from $15 to over $500 a year for lots varying in size from five to more than 500 cars now will be assessed $15 plus $3 per car space per year. A 200-car lot, which had been paying $300, now will be charged $615.

Legislation proposing the creation of a publicly-controlled authority to finance and construct an underground parking garage beneath Boston Common was favored by Boston business leaders at a hearing conducted by the Massachusetts state legislative committee on cities.

The Greater Boston Chamber of Commerce and the Boston Retail Trade Board were among groups advocating repeal of a 10-year-old law to have the garage project privately financed and the enactment instead of new legislation to set up an authority to handle it.

"Another year has passed and there is still no sign that any private interest will build this garage," said Allen Davidson, president of the Retail Trade Board. "Yet we are faced with the greater urgency of providing more off-street parking facilities if we are to save downtown Boston."

Arthur P. Wilcox, representing the chamber, called for an "adequate" garage to house from 1,500 to 2,000 cars. He said the decision of the Prudential Insurance Co. to build a $100 million development in Boston "makes it most imperative that we do not neglect existing properties of downtown Boston."

Others speaking for the bills included William H. Kerr, chief assistant in the Boston Law Department, who represented Mayor Hynes; Clarence A. Roberts of the Boston Real Estate Board; Daniel Bloomfield, executive secretary of the Retail Trade Board, and Rep. George E. Rawson, Newton Republican.

Opponents of the authority proposal included Robert Bruce of the Metropolitan Garage Association; residents of the Beacon Hill area, and representatives of several social organizations.

Another Massachusetts legislative proposal, sponsored by Rep. George W. Porter, Agawam Republican, would create a five-member commission to study possibility of constructing a

parking space beneath the present State House parking lot in Boston.

Michigan

Marking further progress in the off-street parking program of the Detroit Municipal Parking Authority, dedication ceremonies were held Feb. 5 to mark the completion of a 700-car garage under the Ford Auditorium.

Rates for the two-level underground parking project, which cost $1,575,000, were fixed at 25 cents for the first hour and 15 cents for each additional hour to a maximum of $1.15. Evening, Sunday and holiday rates were set at 75 cents, and a monthly parking rate was fixed at $20.

Three weeks earlier the Detroit authority opened to the public a 587-car parking garage at Second and Howard. It cost $1,250,000.

By spring or early summer, the authority expects to open a 1,050-car trilevel parking garage beneath Grand Circus Park. This project is being constructed at a cost of $4,100,000.

Among other Michigan developments, Lansing city councilmen approved a continuing pay-as-you-go off-street parking program which will bring about the purchase of two new municipal parking sites and the acquisition of others later.

Meanwhile, the Lansing City Council amended a city ordinance to provide that all future money collected through local parking meters shall be used exclusively for expansion of off-street parking facilities and for maintenance of lots and the meters on the streets.

Lansing now receives nearly $200,000 annually in meter revenue. City officials said upwards of $160,000 of this money will be slated each year for the purchase of off-street parking facilities.

Missouri

A bill introduced in the Missouri legislature would authorize construction of an underground parking garage near the state capitol building in Jefferson City.

Constitutionality of a 1955 change in a state law permitting municipalities to operate off-street parking facilities was upheld by the Missouri Supreme Court.

The amendment upheld by the court permits using the receipts from on-street parking meters to help finance off-street parking projects.

The opinion was handed down in a suit brought against the city of Liberty by a citizen, W. H. Jones, who argued that the 1955 amendment was unconstitutional and the Liberty City Council used illegal methods in setting up a public parking revenue bond issue of $160,000.

Clay County Circuit Court agreed with Jones, asserting that the provisions set up by the council were "unreasonable, illegal and void and constitute a bargaining away of the police power of the city."

The State Supreme Court declared, however, the amendment was constitutional and the city council had broad authority to establish a system by which it could ease traffic congestion.

Nebraska

Two bills that would have allowed cities and towns to purchase land for off-street parking were killed by the Nebraska legislature's government committee.

One of the proposals, listed as LB 102, would have allowed the mayor and council of first class cities to provide for off-street parking through ordinance. The other, LB 113, would have authorized second class cities to acquire off-street parking.

In another development, the Omaha City Planning Commission approved proposed city ordinance changes intended to stimulate the building of off-street parking lots. The proposals were drafted by City Planner Alden F. Aust after several months of study and consultation with real estate and Chamber of Commerce committees.

One of the proposed Omaha changes would require a builder to provide for adequate off-street parking as a condition for obtaining a construction permit. Another change would set up a new zoning classification in which parking lots would be permitted.

New Jersey

The Newark Parking Authority announced the selection of the Newark engineering and architectural firm of Frank Grad & Sons to draw the most feasible plans, economic and engineeringwise, for an underground parking garage beneath Newark's Military Park.

It was Frank Grad who nearly 29 years ago first envisioned such a parking facility. His original plan was for a garage with a capacity of between 1,500 and 2,500 cars to be constructed under that portion of the park between Trinity Cathedral and the Wars of America monument.

Grad said the general concept would still hold good today, but changes would have to be made to meet modern conditions.

Grad noted that the authority also awarded a contract to Ramp Buildings Corp. of New York to conduct the main technical studies on the economic and engineering feasibility of the garage. He said the architects would draw plans to coordinate closely with the Ramp findings.

The studies will be financed by an interest-free loan of $180,000 granted the authority by the federal government The loan would have to be repaid only if the authority proceeds with construction.

Cost of the proposed underground garage has been estimated at approximately $3,000,000.

North Dakota

A bill introduced in the North Dakota legislature would permit cities of 5,000 or more population to install parking meters if approved by a countywide vote.

Rep. Kenneth Lowe of Grand Forks, one of the sponsors, said the measure was drafted to include a countywide vote to give residents of the immediate trade area a voice in the restoration of parking meters.

The measure would require the county to call a special election upon petition of a city of 5,000 or over, with the petitioning city standing the expense of the election.

The bill would require a two-thirds vote in both branches of the state legislature because parking meters were prohibited in North Dakota by an initiated measure to outlaw them in June 1948, and the law was upheld in a referendum that fall.

The proposed new legislation would provide that parking meters could not be operated between 5 p.m. and 9 a.m., on legal holidays, within safety and no-parking zones and in residential areas as defined by ordinance.

Ohio

Constitutionality of on-street parking meter fees was upheld by the Ohio Supreme Court, which ruled that such fees were not a levy of a tax.

The opinion was handed down in a case from Cincinnati, where Frank T. Garrett had sought to enjoin the city from collecting the fees. He contended such fees were not only excessive, but were being used to finance off-street parking facilities.

(Continued on page 298)

Modification of Fixed Time Signal Controller to Give Semi-Actuated Operation

By J. T. Hewton (Jun. Mem., ITE)
Signal Engineer
Metropolitan Toronto Traffic Engineering
Toronto, Ontario

THE CIRCUIT to be described was developed in order to provide a simple, reliable and inexpensive method of obtaining semi-actuated operation from a fixed-time traffic signal controller while still retaining many of its advantages, principally with regard to ease of interconnection and positive interval timing, with the latter capable of pre-selected periodic variation.

Fig. B. shows the necessary circuit changes and setting up data when this circuit is applied to a Canadian General Electric, type F_1 multi-dial controller. In this case, dials can be set up to give the optimum main and side street minimum and maximum times for different traffic conditions, with dial transfer taking place in the usual manner while twelve signal and two offset contacts are available for normal use.

Using the methods described herein, it should be possible to convert an existing field-time traffic signal installation to semi-actuated operation for about $300.00 including two detectors, the detector relay, the actuating relay and all labour, assuming the detectors mounted on existing utility poles.

Circuits

The circuits involved are very simple as can be seen from Fig. A, the only additions required being two three pole double throw relays with 115V coils. One of these R_1 acts as a detector relay and the other R_2 as a memory and actuating relay. Any type of detector may be used provided that, on actuation, it completes a circuit to ground, either directly or through an auxiliary relay unit.

Alterations

The alterations required in the original controller are equally simple requiring only the following changes in the timer unit writing:—

1. The separation of two sets of cam contacts X and Y from the signal bus:
2. The connection of the common side of these cam contacts to one side of a set of dial offset contacts Z.
A. The connection of the other Y cam contact to the drum operating circuit:
3. The connection of the other offset contact to the live side of the drum advance contacts instead of its normal connection to the motor brakecoil:
4. The connection of the live side of the drum release dial contacts to the lead discarded from the Y cam contact instead of its normal connection to the signal bus.

When the above changes have been made all necessary leads will be available at the terminal panel and the actuating relay unit, wired up as shown, can be either mounted on the panel if there is room or placed somewhere else in the cabinet, its leads being connected as follows:

1. To the auto side of the auto-flash switch or to the live side of the flash relay if the latter is provided;
2. To the normal Y cam terminal;
3. To the normal X cam terminal;
4. To the auto side of the hand auto switch, the normal lead being first removed;
5. To the detector or detector relay;
6. To the common side of the A.C. line;
7. To the normal Z offset terminal;
8. To the lead removed from the hand auto-switch.

Additional terminals may be mounted on the panel to facilitate these connections and to enable the actuating unit to be easily removed or replaced, or, if a sufficient number of units are involved, they could be assembled on small sub-panels arranged to plug into jacks mounted in the main panel. In the latter case it would be necessary to alter the panel wiring to bring the appropriate leads to the jacks.

Actuated — Pre-Timed Selection

Switches or jumpers should be provided on the panel so that relay contacts R_1A and R_2B can be shortened out thus allowing the controller to function on a fixed time basis if the relay unit is removed for any reason.

Operation

Set for actuated operation, the circuit functions in the following manner:

No Actuation

R_1A is open thereby stopping the drum in its lock position, which should immediately precede the main street amber position. The dial continues to rotate thereby maintaining synchronism.

On Actuation

Relay R_1 closes and is held through R_1C and R_2A. R_1A closes, thereby allowing the drum to operate when next the drum release contacts are closed by their dial key. The main street amber interval will then be timed out and the drum will go to the side street green position where contacts X will close, thus completing a circuit from offset contacts Z, through R_1B to R_2 which will therefore close when Z is closed by an offset key placed so as to give about 5 seconds less than the desired minimum side street green time. The closing of Relay R_2 opens contacts R_2A thereby allowing R_1 to open, contacts R_2C serve to hold R_2 closed during the time Z is closed thus preventing the drum being operated through contacts R_1B and R_2B.

No Further Actuation

If no further actuation is received, a second closing of contacts Z, by an offset key placed so as to give the de-

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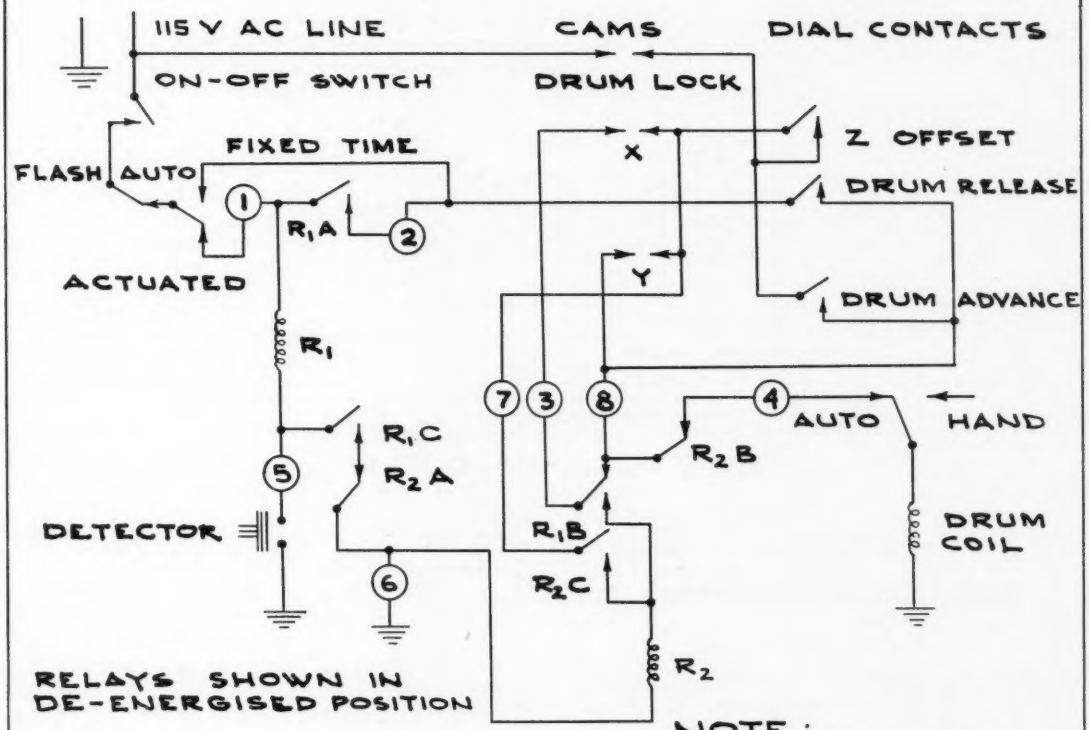
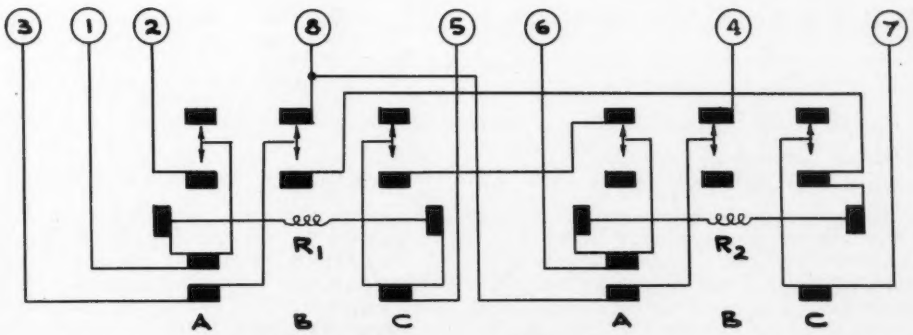
FIG. A





MODIFICATION TO A FIXED TIME TRAFFIC SIGNAL CONTROLLER TO GIVE SEMI-ACTUATED OPERATION

MUNICIPALITY OF METROPOLITAN TORONTO

TRAFFIC ENGINEERING DEPARTMENT

FIG. B

INTERVALS

O-A MAIN STREET MINIMUM GREEN

A-B MAIN STREET AMBER

B-C SIDE STREET MAXIMUM GREEN

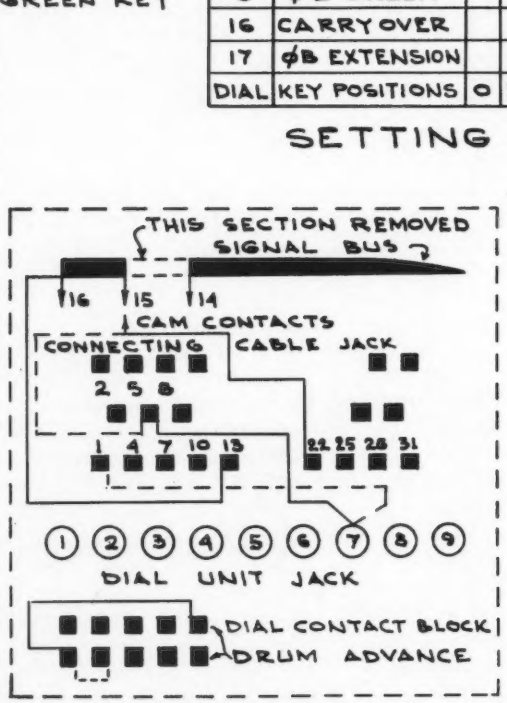
C-D SIDE STREET AMBER

A IS THE GREEN KEY

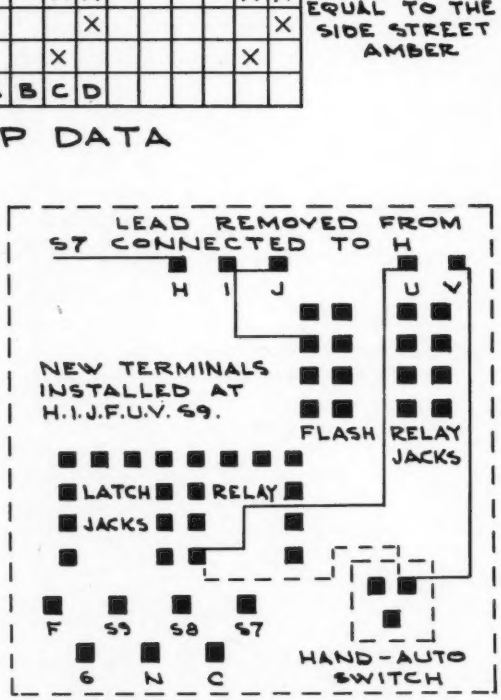
CAM NO.	CAM FUNCTION	DRUM POSITION X-CONTACTS CLOSED											
		1	2	3	4	5	6	7	8	9	10	11	12
1	DRUM LOCK	X	X		X	X	X	X	X		X	X	X
2	DIAL TRANS.	X						X					
3	ϕA RED					X	X					X	X
4	ϕA AMBER				X						X		
5	ϕA GREEN	X	X	X	X			X	X	X	X		
6	ϕB RED	X	X	X	X			X	X	X	X		
7	ϕB AMBER						X						X
8	ϕB GREEN					X	X					X	X
16	CARRY OVER						X						X
17	ϕB EXTENSION					X						X	
DIAL	KEY POSITIONS	O	5	A	B	C	D						

WHITE OFFSET KEYS SHOULD BE LOCATED BETWEEN B & C. THE FIRST BEING PLACED SO AS TO GIVE 5 SEC. LESS THAN THE DESIRED MINMUM SIDE STREET GREEN TIME & THE OTHERS FOLLOWING THIS AT INTERVALS EQUAL TO THE SIDE STREET AMBER

SETTING UP DATA



TIMER UNIT



TERMINAL PANEL

----EXISTING WIRING TO BE REMOVED ——NEW WIRING

PANEL CONNECTIONS

MAGNETIC DETECTORS TO F & 6

MR 9R MAGNETIC DETECTOR RELAY
DET. + TO F DET. − TO 6
AC + TO 1 AC − TO 6
DISPATCHER DETECTOR TO S9

PRESSURE DETECTORS TO S9 & G

ACTUATING RELAY UNIT
LEAD #1 TO J LEAD #2 TO H
LEAD #3 TO S8 LEAD #4 TO V
LEAD #5 TO S9 LEAD #6 TO 6
LEAD #7 TO POINT #4 ON INTER-CONNECTING STRIP. LEAD #8 TO U

NOTE:

FOR FIXED TIME OPERATION JUMPER H & I
FOR SEMI-ACTUATED OPERATION JUMPER I & J
IF RELAY UNIT IS REMOVED JUMPER V & U

MODIFICATION OF C.G.F.C. TYPE F, TRAFFIC SIGNAL CONTROLLER FOR SEMI-ACTUATED OPERATION

sired minimum green, will operate the drum through contacts R_1B and R_2B thereby bring on side street amber, opening contacts X and closing contacts Y. A third offset key placed so as to give the desired amber time will then operate the drum through contacts Y and R_2B bringing on Main Street green. The drum will then be operated by each succeeding plain key until it comes to rest in the lock position.

Further Actuation

If a further actuation is received after the first offset key passes, relay R_1 will close and remain closed until released by the second key thereby preventing this key from operating the drum. The third key will then either release R_1 again or operate the drum, depending on whether or not there has been an actuation between keys two and three. Thus, if a succession of offset keys, spaced an amber interval apart, are placed in the dial, an actuation received during any one of these intervals will cause the green time to be extended by an amount equal to the amber time. If there is no actuation during any one of these intervals the green will be terminated by the next offset key.

Continuous Actuation

When there is continuous actuation, none of the offset keys will be able to operate the drum and the maximum side street interval will be timed out, being concluded by a normal drum advance key placed at the required amber interval before dial zero. In this case, relay R_1 will remain closed thus allowing the controller to operate as though it were on fixed time for as long as the condition of continuous traffic lasts.

It should be noted that there may be a delay of up to one full cycle before the controller responds to actuation since, if this is received just after the drum release key has passed its operating position, nothing can happen until this key comes around again.

Detectors

To complete this simple modification an equally simple method of installing vehicle detectors is required and can be realized by using wide range non-compensated magnetic units. These may be located at the pavement edge being mounted vertically and placed either over or underground.

When mounted above ground, the top of the detector should be at a height of about two feet, the unit being attached to a non-metallic utility pole or enclosed in a four-inch fiberglass or plastic pipe set into the sidewalk or shoulder.

When mounted underground, the top of the detector should be at a depth of about six inches, the unit being contained in a four-inch fiber duct placed at the most convenient location near the pavement edge.

When mounted in this way, these detectors will have a range of about fifteen feet, thus one detector mounted at the back of a five or six-foot sidewalk can cover a single traffic lane.

SIGNAL SYSTEM

(Continued from page 264)

College to Adams Street, averaged 78,000 vehicles daily.

Eastbound vehicle speeds on Broad Street under the simultaneous system, increased approximately 3.2 MPH during morning and afternoon peak hours and 0.4 MPH in off peak hours, over the speeds recorded under the triple alternate system. See Table II.

Eastbound vehicles traversing the entire length of this portion of Broad Street — Adams to 11th, under the simultaneous system, effected an average saving of 1 minute 15 seconds—morning peak, 9 seconds—off peak and 1 minute 51 seconds—afternoon peak, as opposed to the average trip time recorded under the triple alternate system.

The simultaneous system also reduced the average number of stops for traffic signals. Eastbound vehicles had an average of 1.6 less stops—morning peak, 1.3—off peak and 4.3—afternoon peak.

Under the simultaneous system, average speeds for westbound vehicles increased 2.3 MPH — morning peak, decreased 2.8 MPH—off peak and increased 4.5 MPH—afternoon peak.

The average driving time for the study length of Broad Street decreased 1 minute 1 second—morning peak, increased 51 seconds—off peak and decreased 2 minutes 5 seconds—afternoon peak, under the simultaneous system.

The average number of stops for traffic signals, under the simultaneous system, decreased by 1.7—morning peak increased by 0.7—off peak and

Figure 3
A Broad Street corner signal installation in Richmond, Virginia.

decreased by 3.8—afternoon peak, for westbound vehicles.

Table III indicates to some degree results of the left turn phase introduced into the traffic signal at 12th and Broad Streets during the second week of study.

It can be seen that the change in the signal produced very little difference in speed and time, for eastbound vehicles, between 11th and 12th Streets. However, westbound vehicles, between College and 12th Streets, had their former average speed cut in half and their time required to clear this block, doubled. During the afternoon peak hours the time increased 170 per cent.

Despite the brief period between the "before" and "after" studies the following results were obtained:

1. Average speeds were increased with the simultaneous system.
2. Time required to traverse the entire study length of Broad Street was decreased, particularly, during peak hours of travel.
3. Number of stops for traffic signals were decreased.

It was also noted that blocking of cross street traffic by vehicles on Broad Street was eliminated, thereby reducing delay and congestion to vehicles on cross streets.

From the comparable data contained in this report it can be concluded that the simultaneous signal system is superior to the triple alternate signal system for this section of Broad Street.

Traffic News

Canada Developing Uniform Manual On Control Devices

The first National Highway Safety Conference in Canada was convened at Ottawa in May, 1955. At this conference, one of the main objectives set out by the Engineering Committee was the development of a uniform system of traffic control devices for streets and highways throughout Canada. The Conference considered that nation-wide uniformity in signs, signals and markings was a very important aspect in any concerted effort to reduce the alarming traffic accident toll across the country.

As far back as 1940 the standardization of traffic control devices in Canada was recommended by Mr. J. O. Martineau, Assistant Chief Engineer, Department of Roads of the Province of Quebec, in a report to the 25th Annual Meeting of the Canadian Good Roads Association. However, Canada-wide uniformity has not been realized to date, although the majority of the provinces and major cities have closely followed the U. S. Manual, or used it as a guide.

No real action was taken in the formation of a committee to undertake this urgent task until early in 1956. At the invitation of the Canadian Good Roads Association, a small group of interested traffic engineers met with the representatives of C.G.R.A. in Ottawa. At this first meeting it was agreed that a committee to work on this problem would be jointly sponsored by the C.G.R.A. and the Canadian Section of the Institute of Traffic Engineers. The Canadian Good Roads Association agreed to undertake the publishing and distribution of the Manual, and the members of the Canadian Section, I.T.E., offered to provide the technical leadership.

Because there was at this time no official committee, this small group designated itself as the working committee of the C.G.R.A.—C.I.T.E. members and held several organization meetings in Ottawa. At these early meetings one of the first things to be decided was who should be invited to participate on a Uniform Manual Committee and how should they be contacted. It was unanimously agreed that the official committee should be as representative as possible of all the provinces and cities across the country. In addition, it was agreed that national agencies closely related to the traffic control problem should be represented on this committee.

The next question for the working committee was the selection of a time and place for the first meeting to bring together as many representatives as possible for the official formation of a Joint Committee on Uniform Traffic Control Devices. In order to get an action program underway as quickly as possible it was decided to hold the first meeting of the Joint Committee in conjunction with the second annual Canadian Highway Safety Conference at Winnipeg in May, 1956.

Official invitations were then sent out to the ten provinces and 11 major cities representing as wide a geographical and climatic cross-section of Canada as possible. Invitations were also sent to ten national agencies, and five members of the C. G. R. A. and five members of the Canadian Section, Institute of Traffic Engineers were appointed to the Joint Committee.

At the Winnipeg meeting the necessity for uniformity in traffic control was outlined to the delegates present and the Joint Committee on Uniform Traffic Control Devices for Canada was officially formed. A slate of executive officers was elected and the Committee started to work immediately. Before the end of the day, an action program was planned and a Chairman and Secretary were elected for each of six subcommittees.

The composition of the Joint Committee is as follows:

One representative from each of the ten Provincial Highway Departments	10
One representative from each of the 11 major Canadian cities	11
One representative from each of the following national organizations:	
Board of Transport Commissioners for Canada	1
Canadian Association of Chiefs of Police	1
Canadian Highway Safety Conference	1
The Engineering Institute of Canada	1
The Royal Canadian Mounted Police	1
Five representatives of the Canadian Goods Roads Association	5
Five representatives of the Canadian Section, Institute of Traffic Engineers	5
	36

As a matter of interest, the Canadian Standards Association was also invited to be represented on the Joint Committee, and although represented at the initial meeting in Winnipeg, declined to accept the invitation. The reason given was that the Association's function as the national standards agency prevented it from participating in initiating the formulation of standards. It was also stated that the Association investigates requests for standards and, if considered justified, sets up the required technical committees to consider the applications. While the Joint Committee considered that representation from the C.S.A. was desirable, it was agreed that future relationship between the two groups and the advisability of submitting the manual, when prepared, to the Association for approval as a Canadian Standard could be considered at a later date.

ITE representation on the Joint Committee is excellent. In addition to the five official representatives of the Canadian Section, two of the Provincial representatives, five of the City representatives, and three of the five C.G.R.A. representatives, are ITE members. These members are as follows:

Walter Q. Macnee, Province of Ontario; John H. Harding, Province of British Columbia; Bob H. Burton, City of Toronto; Bill Finnbogason, City of Winnipeg; Art Lomax, City of Hamilton; Woody Rankin, City of Ottawa; Ken Vaughan - Birch, City of Vancouver; Bert Edwards, C.G.R.A.; Philippe Ewart, C.G.R.A.; Frank Gillies, C.G.R.A.; Jacques Barriere, ITE; Harry Burns, ITE; Bob Campbell, ITE; Sam Cass, ITE; John Walker, ITE.

The Executive Committee consists of the following:

Walter Macnee, Member ITE, *Chair-*

man; Philippe Ewart, Member ITE, *Co-Chairman*; Harry Burns, Member ITE, *Editor*; Jacques Barriere, Member ITE, *Assistant Editor*; R. A. Draper, Member C.G.R.A., *Secretary*.

Seven technical subcommittees are active in preparing the initial drafts, six of which are the same as the subcommittees of the U. S. Joint Committee. The seventh is the Subcommittee on French Language considered essential because of the extensive usage of the French language in the Province of Quebec. Because of the existence of two official languages in Canada, every effort is being made by the Signs Committee to use symbols instead of word messages wherever possible.

All chairmen and secretaries of the technical committees are members of the ITE with the exception of Mr. Alan K. Hay, Chief Engineer of the Federal District, Ottawa, who is Chairman of the Research Committee. Practically every Canadian member of the ITE is serving on at least one technical committee, and a concerted effort is necessary if the schedule dates are to be met. This schedule calls for a preliminary draft to be submitted by each committee for consideration at the next meeting of the Joint Committee to be held in Quebec City during the third annual meeting of the Canadian Highway Safety Conference in May, 1957. Following this meeting, it is planned to distribute a second draft to all technical committee members for study and revision before submitting the final draft to the Joint Committee at the 38th Annual Meeting of the Candian Good Roads Association in Saskatoon, Saskatchewan, in September of this year. It is hoped that official approval of the Joint Committee will be obtained at this meeting so that the manual can be printed for distribution early in 1958.

Following the preparation and distribution of the manual, the task of getting the provinces, cities and municipalities to adopt the manual remains to be done. However, with the representative membership of the Joint Committee will be obtained at this meeting so that the manual can be printed for distribution early in 1958.

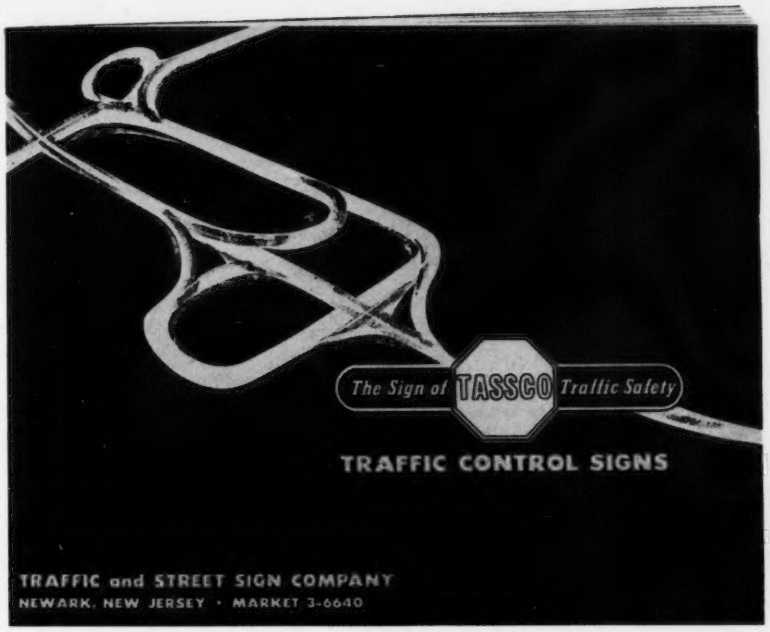
Following the preparation and distribution of the manual, the task of getting the provinces, cities and municipalities to adopt the manual remains to be done. However, with the representative membership of the Joint Committee, and the goodwill enjoyed by the C.G.R.A. at the various government levels throughout the country, little difficulty is anticipated in this regard.

While the schedule is an ambitious one, the task is simplified by the existence of the U. S. Manual. This manual is being used as a reference and guide by all technical committees with members requested to submit alternate or additional suggestions where they consider Canadian conditions or other reasons warrant changes. As a result, it is expected that the Canadian Manual will be basically the same as the U. S. Manual, with some difference in details, and it is hoped, with possibly some improvements.

The Manual is to be published in English for distribution across Canada, with a French version also being published for distribution principally in the Province of Quebec.

Engineers Salaries Up in 1956

Engineers and other professional employees in American industry now are earning about 8.6 per cent more than they earned last year, according to a survey of the American Manage-


The Sign of TASSCO Traffic Safety
TRAFFIC CONTROL SIGNS
TRAFFIC and STREET SIGN COMPANY
NEWARK, NEW JERSEY · MARKET 3-6640

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Here's the big, new, comprehensive catalog from the nation's leading specialist manufacturer of traffic and street signs in every category.

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The Sign of TASSCO Traffic Safety

TRAFFIC & STREET SIGN COMPANY, 84 FOUNDRY ST., NEWARK 5, N. J.

ment Association's Executive Compensation Service. The survey, covering the period May 1955 to May 1956, showed the increase to be higher for engineers than any other executive and specialized groups covered. For the comparable period of the previous year the increase was reported at 4.5 per cent.

The AMA study covered more than 31,400 engineers, scientists and administrative employees in 49 different activities at five levels of responsibility. All the jobs covered were in the "exempt" categories, and most of the positions were technical or highly specialized in nature, ranging from machine and tool designer to ceramic engineer. Engineers with less than one year of experience are earning a median salary of $5,300 a year, regardless of area of specialization, the survey reported. The next higher category of engineers, with experience ranging from one to three years, had a median salary of 6,500 a year. In the top ranges of the technical and professional group the pay levels tend to overlap those of middle management, the survey indicated. However, it was found that engineers and scientists are much less likely to receive bonuses than are the members of middle management.

—from bulletin of National Society of Professional Engineers

Highway Safety Research Publications Reissued

In response to a continuing demand for two publications of its former Committee on Highway Safety Research, the National Academy of Sciences—National Research Council has reissued two of the Committee's publications. These are "The Field of Highway Safety Research; a Brief Outline" taken from the text as revised in August 1952; and the "Report of the Highway Safety Correlation Conference" held in Washington on June 5 and 6, 1952. These publications are available in one volume from the Publications Office at $1.50 for 8½ x 11-in. paper bound copies. They are identified as Publication 454. Two items taken from the *News Letter* of this Committee have been added to the text of these two publications to supplement the information to the end of 1953. These items show the recommended research area priorities and the outline of a pilot study employing operations research in highway safety.

The original distribution of these publications was made largely to individuals interested in the conferences held under the auspices of the Committee on Highway Safety Research. The present printing makes these valuable publications, which have been out of print for some time, available at a time when there is a markedly renewed interest in and increased emphasis on highway safety research.

The text of these publications has been retyped in preparing Publication 454 and the page numbers do not correspond to those of the original publications. The original format is available on four Microcards from the Publications Office of the Academy-Research Council at $1.00 for the four cards. The Microcard reproduction lacks the text of the two items taken from the Committee's *News Letter*.

Garden State Parkway Reports Low Death Rate

The Garden State Parkway maintained its position as one of the safest highways in the nation last year.

Chairman Katharine E. White of the New Jersey Highway Authority reports that the Parkway had a fatality rate of 1.3 per 100 million vehicle miles during 1956.

The 1955 fatality rate, which earned the Parkway distinction as a national leader in highway safety, was 1.2 deaths per 100 million vehicle miles. A total of 996,915,000 miles was driven on the Parkway during 1956 as compared to 808,600,000 miles in 1955.

There were 12 fatal accidents resulting in a total of 13 fatalities during the past year on the Parkway.

During the first 10 months of last year, the fatality rate on all New Jersey roads was 3.1 per 100 million vehicle miles. The national rate for the same period of 1956 was 6.0.

Commissioner White said the motorists themselves and the State Police patrolling the Parkway on a 24-hours-a-day basis deserve a large share of the credit for the 1956 safety record. While noting that the Parkway was designed with special built-in safety features, she said such innovations are futile without sensible driving.

Of the 12 fatal accidents on the Parkway last year, 7 were single-car mishaps. One of the fatalities was a pedestrian. Parkway regulations bar pedestrians from use of the roadways.

There were no fatal accidents on the Parkway during the months of February, April, September and November last year.

New Film to Aid Engineering Education Now Available

The type of training necessary for the engineering profession and the engineer's role in planning the world of tomorrow are subjects of a new non-technical, color movie just released by the College of Engineering of Ohio State University.

The new 20-minute sound film "Engineering For Eddie," centers on the "fairy-tale world" of little Eddie Smith. It is designed to serve as a guide to today's youngsters, and their parents, in evaluating the educational requirements and practical applications of engineering training.

The movie is to be shown to general audiences and outlines the contributions of the engineer to the state and the nation. It also represents an attempt to encourage qualified students to enter one of the many fields of engineering to help meet the critical need for more and better trained engineers.

The setting is the home of young Eddie Smith, the symbol of American youth today, who is full of energy and and eager to learn about the world around him.

Typical scenes include an ordinary modern kitchen, furnace tests of wall construction, a rocket take-off, university laboratories, traffic snarls, assembly line, and many others.

The production defines the engineer's role — both social and scientific —and attempts to answer four questions: What is an engineer? Why is he needed? What does he need to know? How does he become an engineer?

"Engineering For Eddie" is available on a free-loan basis or for purchase from the Department of Photography, Motion Picture Division, Ohio State University, Columbus 10, Ohio.

The film was produced by the Department of Photography and was written and directed by Prof. Robert W. Wagner, of the motion picture division.

Technical advisors were Profs. Francis W. Davis, Samuel B. Folk, Robert S. Green, Robert M. King, Charles J. Vierck, and Elliot L. Whitaker, all of the faculty of the College of Engineering.

New Publications

Utilization of Highway Engineering Manpower

Bulletin 134, Highway Research Board, 2101 Constitution Avenue, Washington 25, D. C., December 1956, 101 pp., $2.20.

This bulletin contains nine papers presented at the 35th Annual Meeting, Highway Research Board, January 1956.

"Observed Manpower Requirements," by C. E. Fritts, discusses the conditions leading to the shortage of highway engineers and the requirements for meeting the needs.

"Six-State Classification Study of Engineering Personnel," by Ralph S. Lewis, reports a comparison study of the methods of classifying engineering personnel in a selected group of states.

"Michigan Engineering Trend Study," by Merle J. Walker.

"Local Highway Engineering Manpower: Appraisal and Action," by Wayne H. Snowden, reports on a survey of 100 cities and counties in California.

"Potential Supply of Manpower for an Expanded Secondary Road Program," by John E. Stoner.

"Minnesota's Organization and Methods Section," by K. L. Bergstralh, describes the unit, its purpose, the operating policy, and its accomplishments.

"Time-Saving Ideas in Highway Engineering," by M. Earl Campbell, reports the highlights of the HRB canvass of state highway departments to assemble methods of saving time in highway engineering production.

"Increasing Productivity in Engineering," by L. R. Schureman.

"Utilizing Business Machines in Traverse and Earthwork Computations," by Sam Osofsky, R. K. Breece, John A. Haller, and Walker L. Ayres.

Highway Transportation Legislation in 1956

National Highway Users Conference, National Press Building, Washington 4, D. C., December 1956, 25 pp.

This report summarizes Federal and State legislative activity during 1956, when the Congress and twenty-five state legislatures met.

Sections of the report deal with (1) Federal highway legislation, (2) highway taxation and finance, (3) uniform laws and motor vehicle regulation, and (4) highway laws. No detailed description is provided of bills enacted, but the significance of new statutes is clearly indicated. Also mentioned where pertinent are bills introduced but not passed.

A final section lists dates for 1957 legislative meetings.

Street Transportation—Improving Its Management in San Francisco

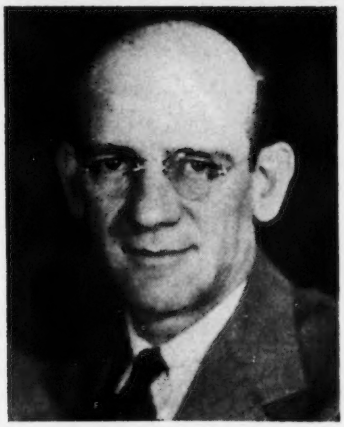
Automotive Safety Foundation, 200 Ring Building, Washington 6, D. C. 1957. 50 pp.

A report of the administrative study made by the Automotive Safety Foundation of traffic engineering in San Francisco.

Although of primary interest to those concerned with San Francisco, the report contains a valuable section on basic management functions in the traffic engineering field. Also of general interest is the proposal for a Department of Street Transportation, with bureaus for construction, operations, maintenance, planning and administration.

A limited number of copies of the report are available upon request to the Foundation.

(Continued on page 278)



Lawrence S. Tuttle

Lawrence S. Tuttle, 52, Associate Member of the Institute of Traffic Engineers, died January 29 in Nashville, Tennessee, following a stroke.

Mr. Tuttle, who served as an engineer with the Bureau of Public Roads for 25 years until 1953, joined the staff of the Automotive Safety Foundation when he left the Bureau. Since 1954, he had lived in Nashville, and was in charge of highway engineering needs studies being conducted for the State of Tennessee by the Foundation. From 1953 until moving to Nashville, Mr. Tuttle represented the Foundation as Supervising Engineer of a highway needs study in West Virginia and lived in Charleston.

Born in the Philippine Islands, Mr. Tuttle received his early schooling at Honolulu Military Academy and was graduated from Stanford University in 1928 with a degree in civil engineering. Immediately after graduation, he joined the Division of Management of the Bureau of Public Roads, engaging in cost studies of highway construction in the Western States. He took a year's leave of absence from the Bureau in 1929-30 to study traffic research and business administration at Harvard University.

Upon his return to the Bureau, Mr. Tuttle became a member of the Division of Highway Transport. In that Division, he played an important part in establishing the Highway Planning Surveys as a permanent feature of every State Highway Department.

In 1939, Mr. Tuttle became Assistant to the Commissioner of Public Roads. The work involved a great deal of time as liaison officer between the Bureau and the State Highway Departments, as well as with numerous other governmental agencies.

Mr. Tuttle also represented the Commissioner of Public Roads in a $14 million bridge project across the Mississippi River at Memphis. This was completed and opened to traffic in December, 1949.

From 1946, Mr. Tuttle was in charge of assistance to and training of engineers from other countries who came to the United States to study highway practice. This involved more than 1,000 visitors from some 60 countries.

The Department of Commerce Silver Medal for Meritorious Service was awarded Mr. Tuttle in February, 1952.

Mr. Tuttle is survived by his widow, Mrs. Helen McQuaide Tuttle; his parents, Dr. and Mrs. George B. Tuttle, all of Nashville, and four children by his first wife, Mrs. Katharine Boynton Tuttle, who died in 1949.

New Appointments

Holmes Appointed Market Development Representative

Robert S. Holmes (Mem., ITE) has been appointed highway construction representative in the market development division of United States Steel Corporation, Pittsburgh, Pa., it was announced by Robert C. Myers, director of the division.

Robert S. Holmes

In this newly created position Mr. Holmes will correlate the combined effort and interests of the Corporation and its various divisions in support of the 13-year Federal Aid program for construction of the 41,000-mile Interstate system.

Well known in highway and traffic engineering circles, Mr. Holmes is a graduate of Georgia Institute of Technology and served for several years in the Albama and Georgia Highway Departments. Following a year of specialized graduate training at the Yale University Bureau of Highway Traffic, he was assigned to the Pennsylvania Turnpike Commission as special highway engineer on the original 160-mile construction project. He also served for a time as traffic engineer with the National Conservation Bureau.

Following six years of military service, Mr. Holmes became the first executive secretary for the Institute of Traffic Engineers and later became chief highway engineer for the Federal Civil Defense Administration. Before coming to U. S. Steel, he was executive assistant to the president of Wald Industries.

Franklin Leaves Grand Rapids For Vietnam

Jerome D. Franklin (Mem., ITE) has accepted an appointment to the Michigan State University team of technical experts working in Vietnam, and will spend the next two years in that country.

Mr. Franklin has been traffic engineer of Grand Rapids for the past 7½ years, after working in New Jersey for 2½ years. He attended Newark College of Engineering and spent a year at the Yale Bureau, receiving a certificate there in 1947.

A member of the American Society of Civil Engineers, the National Society of Professional Engineers, the American Public Works Association and the Highway Research Board, Franklin has been active in many national groups. He has served as head of Department I of the Institute of Traffic Engineers, dealing with traffic engineering administration, for two years and previously as a committee chairman for several years.

In Vietnam Franklin will be responsible for developing a traffic engineering program. He will be accompanied on the two-year assignment by his family. The address will be MSUG—Box 34, Navy 150—F.P.O. San Francisco, California.

The Franklin Family

Mr. Holmes is a registered professional engineer, a member of the American Society of Civil Engineers, and the Highway Research Board. He served as a director of the Institute of Traffic Engineers from 1953 to 1955, and has long been active in Institute affairs.

Charles M. Noble Appointed Head of Ohio Highways

Charles M. Noble, recently of New Jersey, has been appointed Consultant to the Department of Highways in Ohio. In this position he will be in charge of the Department.

Captain Noble's background embraces a wealth of engineering experience on outstanding projects, notably highways and superhighways. He has been Chief Engineer with the New Jersey Turnpike Authority from its inception early in 1949, originally on a loan basis from the New Jersey State Highway Department where he was Chief Engineer, and within a few weeks, on a permanent basis.

Charles M. Noble

While he was with the Turnpike Authority he had complete supervision over the design and construction of the 118-mile Turnpike, the Newark Bay-Hudson County extension and the direct connection with the Pennsylvania Turnpike, and the widening of the Turnpike from four lanes to six lanes between the George Washington Bridge and Camden interchanges. In all, these projects involved bonded indebtedness of $466,200,000.

Before his association with the Turnpike Authority, Captain Noble had many years of experience in engineering in Florida, Alabama, North Carolina, Kentucky, New Jersey, New York and Pennsylvania. His engineering experience also included harbor development work, bridges, rock and subaqueous tunnels and Naval bases.

(Continued on page 281)

"Untouched by Human Hands"

TRAFFIC SIGNS

Finished By Automation

WALD

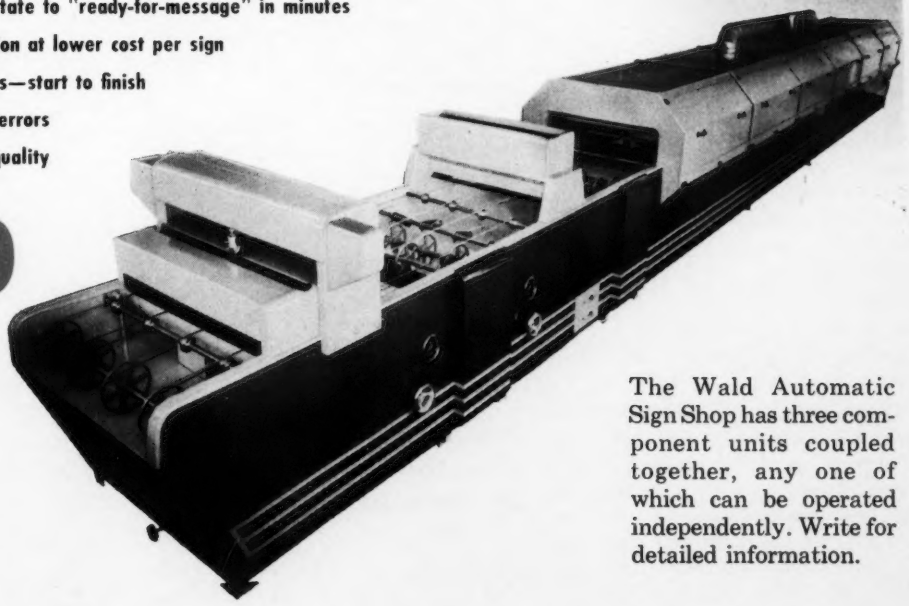
AUTOMATIC SIGN SHOP

A 3-unit conveyorized system for painting, reflectorizing and baking sign blanks quickly in production lots.

- Speeds blank from raw state to "ready-for-message" in minutes
- Delivers greater production at lower cost per sign
- Requires only 2 operators—start to finish
- Minimizes costly human errors
- Assures uniformly high quality

WALD

INDUSTRIES, INC.
HUNTINGDON, PENNA.



The Wald Automatic Sign Shop has three component units coupled together, any one of which can be operated independently. Write for detailed information.

Richard Siver Joins Staff of Sign Manufacturer

Richard W. Siver, (Assoc. Mem., ITE) formerly traffic engineer for the Garden State Parkway in New Jersey, has joined the staff of Traffic and Street Sign Co., Newark, N. J., as consulting Traffic Engineer.

Mr. Siver worked his way through Tri-State College of Engineering, Angola, Indiana, where he distinguished himself by graduating with honors in

Richard W. Siver

1932 with a Bachelor of Science in Civil Engineering.

In the thirties he was engaged as City Planning Engineer for New Brunswick, N. J. In that capacity he prepared the "Traffic Plan for New Brunswick." While there he continued his studies at Rutgers University.

In 1941, he went to the City of White Plains, N. Y. as traffic engineer with the Department of Public Safety. There, after the outbreak of World War II, he drafted a plan for emergency traffic operation and coordination of Westchester County Police agencies to effectuate evacuation of the New York area.

In early 1942, he went to Norfolk, Va., for the Navy and he later became Traffic and Transportation Officer of the 5th Naval District and the Norfolk Naval Operating Base with the rank of Lieutenant U.S.N.R.

From 1946 to 1950, Mr. Siver, as Special Planning Engineer and later Traffic Engineer for Essex County, New Jersey, developed a highway plan for that heavily populated and congested county. His studies in that area contributed to the justification and location of the urban sections of the Garden State Parkway. During 1945, Mr. Siver was Traffic Engineer for the National Conservation Bureau during which period he acted as editor of TRAFFIC ENGINEERING magazine.

Mr. Siver resides with his wife and two children at Manasquan on the New Jersey coast. Mr. Siver is a Registered Professional Engineer in New Jersey.

Barnett Leaves Tulsa For Work in the Consulting Field

Norman C. Barnett

Norman C. Barnett (Assoc. Mem., ITE) has resigned as Traffic Engineer of Tulsa to join the consulting firm of Palmer and Baker at their branch office in New Orleans.

Barnett has been Tulsa's traffic engineer for the past three and a half years. He went to Tulsa after completing the Yale Bureau course in 1953. Earlier he had been assistant traffic engineer in Albuquerque.

A graduate of the University of New Mexico, he has been active in the affairs of the Missouri Valley Section of the Institute, serving recently as editor of the newsletter. He has also been serving as an Associate Editor for TRAFFIC ENGINEERING magazine.

His new address in New Orleans will be c/o Palmer and Baker, P. O. Box 10,096, New Orleans, La.

Nielsen Named Assistant Engineer In Toronto

Thor M. Nielsen (Jun. Mem., ITE) has been named Assistant City Traffic Engineer of Toronto under H. R. Burton (Mem., ITE), City Traffic Engineer.

This position was formerly held by Samuel Cass (Assoc. Mem., ITE), who in December 1954 was appointed head of the Traffic Engineering Department of the Municipality of Metropolitan Toronto. This is a federation of municipalities of the metropolitan area of Toronto, organized in 1953.

Mr. Nielsen came to Toronto in 1954 from Denmark, shortly after graduating from the Royal Technical University of Copenhagen. He is a

Thor M. Nielsen

member of the Institute of Danish Civil Engineers and is a registered professional engineer in Ontario. Currently he is serving on two sub-committees of the Canadian Committee on Uniform Traffic Control Devices, which is developing the first Canadian manual on uniform traffic signs, signals and markings.

NEW PUBLICATIONS

(Continued from page 275)

Model Traffic Ordinance

National Committee on Uniform Traffic Laws and Ordinances, 1604 K Street N.W., Washington 6, D.C.; 1956, 62 pp.

Model city legislation paralleling the Uniform Vehicle Code for States, the Model Traffic Ordinance has been revised and re-issued for the first time since 1953. Revisions in the Code, which was reprinted in revised form late in 1956, are reflected in the Ordinance. In addition, sections are renumbered by major articles for easier reference and for ease of future additions or changes.

Strictly Business

New Sign Catalog Released By Grote

A new catalog, "Signs & Markings for Construction and Maintenance," has been released by the Grote Manufacturing Company.

Particularly appropriate in view of the many road construction projects which will be undertaken soon, this new catalog lists directional symbols, advance warnings, construction signs, barricade strips and other regulatory signs and markings for streets and highways.

Colors and messages on all Grote signs comply with standards set forth in the Manual on Uniform Traffic Control Devices.

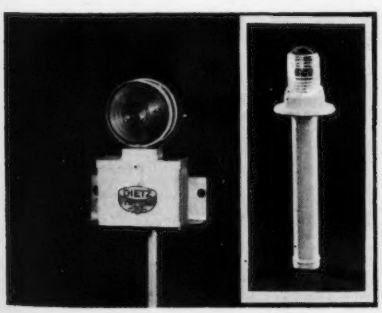
The catalog is available upon request—write to Grote Manufacturing Company, Bellevue, Kentucky.

First Transistorized Flashers Now on The Market

The world's first electronic highway flasher to use transistors is being produced by the R. E. Dietz Company of Syracuse, New York.

The transistorized flasher is available in four models . . . 360 degree barricade, two faced barricade, 360 degree traffic cone, and two faced traffic cone type. Addition of the new flasher makes Dietz Company the nation's only manufacturer of all three basic highway warning lights — flashers, torches and lanterns.

Among the outstanding features claimed for this new flasher are its long trouble-free life, ability to stand up under all weather and use conditions, bright signal, and low cost. According to company officials, prices of the four models are 25 to 50 per cent lower than present flashers on the market. Parts are easily replaceable in all models.



Transistors used in the flasher were developed by General Electric Company whose engineers worked with the Dietz Company in designing the circuits for the new electronic flasher.

Chief advantages of transistors over vacuum tubes used heretofore in electronic flashers are their long life, ruggedness, and requirements of only 1/1000th the power and a small fraction of the space of a vacuum tube.

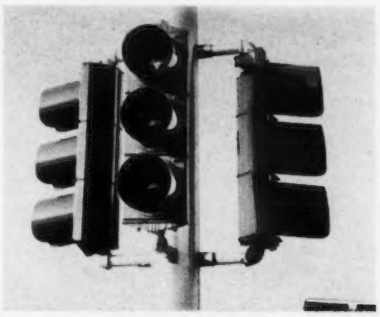
Flashing rate — which can be regulated — is 60 to 70 times per minute.

The two faced models, in both the barricade and traffic cone types, cover a 90 degree field at both front and back, and also provide flashing light to both sides for added safety.

More information can be obtained by writing to Electronic Flasher Division, R. E. Dietz Company, 225 Wilkinson Street, Syracuse, New York.

New Installation Method For Pedestrian Indications

A new, patented aluminum blind clamp for mounting all pedestrian indications is available from Pfaff & Kendall, 84 Fountry Street, Newark, New Jersey. The clamp does away with the usual band-type fastener and permits level and symmetrical mounting of all indicating units, presenting a neat, efficient appearance. Installation time and trouble are said to be minimized through use of this method of mounting.



Overload Detector Described In New Brochure

A new system for weighing trucks in motion is described in a recently printed folder available from the Revere Corporation.

The Cox & Stevens Overload Detector includes strain gage load cells, a shallow-pit weighbridge, transmission cable, and an electronic control unit. The components are pictured in the folder, and the advantages offered by the system are listed.

For copies, write to the Revere Corporation of America, Wallingford, Connecticut.

Positions Available

RACINE, WISCONSIN

Position: Assistant to the City Traffic Engineer.

Qualifications: Engineering graduate with experience in street lighting design and a definite interest in traffic engineering. Duties will include assistance to Traffic Engineer in developing and carrying out a traffic and street lighting improvement program.

Salary: Starting—$5288.64 per year.

Apply: Fred J. Kaiser, Jr., City Traffic Engineer, City Hall, Racine, Wisconsin.

BOULDER, COLORADO

Position: Traffic Engineer.

Qualifications: Engineering graduate with specialization in traffic engineering. Responsible experience in the field may be substituted for college on a year for year basis.

Salary: $4896 to $6168 per year.

Apply: C. M. Broberg, Personnel Officer, City Hall, Boulder, Colorado.

TULSA, OKLAHOMA

Position: City Traffic Engineer.

Qualifications: Engineering graduate, supplemented with special training in traffic engineering, and with three or more years of experience in traffic engineering work.

Work includes supervision of 32 persons, completion of $300,000 signal program, and development of master transportation plan. The budget has been expanding rapidly and is sufficient for normal activity.

Salary: $571 to $728 per month, with chance of starting above the minimum.

Apply: William R. Wooten, City Engineer, City Hall, Tulsa, Oklahoma.

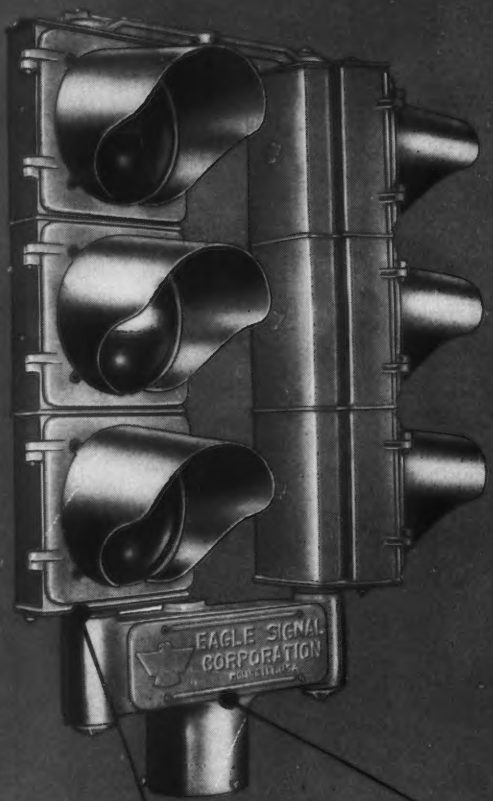
MADISON, WISCONSIN

Position: Assistant Traffic Engineer.

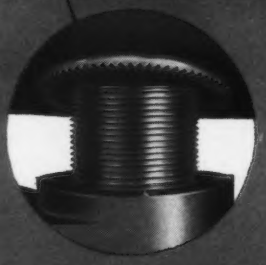
Qualifications: Registered professional engineer to act as assistant traffic engineer in newly established department.

Salary: $622 to $691 per month.

Apply: Personnel Department, City Hall, Madison 3, Wisconsin.



EAGLE S23CTCH SENTRY
TWO-WAY TRAFFIC SIGNAL WITH
KING SIZE TERMINAL COMPARTMENT



SERRATION POSITION LOCKING FEATURE

Neither wind nor pranksters can turn signal after once locked into position. 72 fine teeth or serrations are integrally cast into top and bottom of signal face that fits snugly into 4 notches on terminal bracket to assure positive locking. Signal can be locked in 5 degree increments to point in any direction.

new

EAGLE SENTRY

TRAFFIC SIGNAL with new horizontal terminal compartment

Here is a traffic signal of smart, modern appearance that includes many advantageous construction and design features. New offset construction assures greater stability and compactness — yet lighter weight than conventional signals of curved or multi-surface design. The EAGLE SENTRY Traffic Signal can be locked into any position when used with post top terminal compartment bracket (as shown) or with other serrated brackets.

EAGLE UK 823
TWO-WAY TERMINAL COMPARTMENT

Eagle's NEW post top horizontal terminal compartment bracket for two or three way signals, provides quick easy access to all signal wires. Wide opening gives ample room for tools to reach all twelve terminals.

MAIL COUPON TODAY

EAGLE

EAGLE SIGNAL CORPORATION
Municipal Division
Moline, Illinois

Eagle equipment saves lives . . . saves time

EAGLE SIGNAL CORPORATION
Municipal Division, Dept. TE-357
MOLINE, ILLINOIS

Please send free Bulletin A10-1 containing complete data on Eagle Sentry Traffic Signal

NAME AND TITLE

ORGANIZATION

FULL ADDRESS

CHARLES M. NOBLE

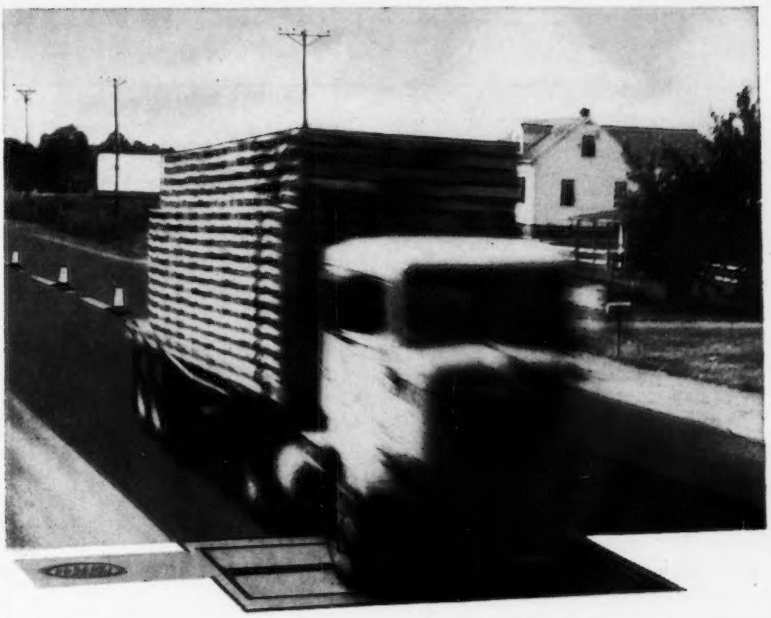
(Continued from page 276)

For thirteen years he had been engineer with the Port of New York Authority on projects totaling $150,000,000. These included the Outerbridge Crossing, the Goethals, Bayonne and George Washington bridges, and the Lincoln Tunnel. He also served as special highway engineer on the Pennsylvania Turnpike, highway engineer on the Pentagon Building, and as New Jersey State Highway Engineer.

He was in military service during both World Wars. In the first World War he was in the U. S. Naval Reserve Force, in sub-chaser service in the English Channel. In World War II he was a Commander, and later promoted to Captain, of the Civil Engineer Corps of the U. S. Navy. He commanded the 22nd U. S. Naval Construction Battalion and the 6th U. S. Naval Construction Regiment for eighteen months in Alaska and the Aleutians during World War II, constructing Naval bases, airfields, docks, etc. In addition he was engaged in engineering reconnaissance in China behind the Japanese lines in preparation for landings on the China Coast, and on Admiral Nimitz's staff at Pearl Harbor. Subsequently he served as Deputy Director, Advance Base Department of the Bureau of Yards and Docks, in Washington, D. C.

Among Captain Noble's honors and awards are the Legion of Merit Medal and the Bronze Star Medal for service in World War II; the Arthur Wellington Prize of the American Society of Civil Engineers for his paper, "The Modern Express Highway"; the Clemens Herschel prize of the Boston Society of Civil Engineers for his paper, "The Factor of Safety in Highway Design"; an honorable mention (with two associates) in an international competition for an elevated express highway design; an honorary award from the New Jersey Society of Professional Engineers for outstanding achievement in professional engineering; and the "Chi Epsilon" honorary award by City College of New York.

He is a vice president of the American Road Builders' Association; a member of the American Society of Civil Engineers; New Jersey and National Societies of Professional Engineers; the Highway Research Board; the Association of Highway Officials of the North Atlantic States, and a member of many national committees.



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Institute Affairs

Past Presidents' Award Announced

The 1957 competition for the Past Presidents' Award of Merit has just been announced by the Award Committee. Junior and Associate Members of the Institute who are under 35 as of the closing date of the competition are eligible to compete.

The Merit Award, designed to recognize outstanding performance in the conduct and reporting of technical accomplishments or research, is given annually by a committee of past presidents. The committee this year is composed of Nathan W. Cherniack, Burton W. Marsh, Thomas J. Seburn, and Charles W. Prisk, Chairman. A written report is required and the deadline for filing with the Chairman or a member of the committee is July 23, 1957.

All eligible members are urged to compete for this distinctive honor. Further details will be found in your Yearbook.

Insurance Program

As a result of action by the Board of Direction in approving a life insurance plan for the Institute, President McMonagle has appointed five Institute members as Trustees to adminster the plan for the Institute. These Trustees are: Burton W. Marsh, D. Grant Mickle, Charles W. Prisk, Edward G. Wetzel, David M. Baldwin.

The Trustees will operate under the provisions of a Trust Agreement (copies of which are available from the headquarters office), will actually hold all insurance policies and issue certificates to insured members, and will accept and disperse all funds related to the insurance plan.

Full information on the new ITE life insurance program is now in the hands of all members. With the help of the life insurance company, the Union Mutual Life Insurance Company of Portland, Maine, an attractive booklet was mailed early in February outlining the plan in detail. Several points are important.

First, the amount of insurance for which a member may subscribe is determined automatically by his membership classification and his age. All Junior members may subscribe to $5,000 of insurance—no more and no less. For Associates, the figure is $7,500, and for full Members and Affiliates, $10,000. At age 65, these amounts are cut in half, but the premium does not change.

Second. the initial enrollment period runs from February 15 to April 15, 1957. If you enroll during that period, no medical examination is required.

Third, you must enroll by filling out and returning the subscription form in the back of the booklet and Part I of the insurance application form. The questions about health are a legal requirement—the fact remains that the company will issue the policy despite unfavorable answers to these questions.

Considerable interest in the plan has already been evidenced, and it is hoped that a majority of Institute members will enroll. A comparison of costs clearly indicates that this plan offers coverage at an extremely low figure.

Board to Meet with Texas Section in June

The Board of Direction has accepted the invitation by the Texas Section to hold the spring meeting of the Board in Texas. The Texas Section will hold its semi-annual meeting in Houston on June 7 and 8, and the Board will schedule its spring meeting in Houston on those days.

The spring meeting of the Board in 1956 was held in Denver, where the Board was the guest of the Western Section. The Canadian Section has already indicated its intention to invite the Board to Canada for its spring meeting in 1958.

Canadian Section Given Recognition

Speaking of Canada, all members of the Institute will be gratified by the recognition which has been given the Canadian Section in the development of the new Canadian Manual on Uniform Traffic Control Devices. Elsewhere in this issue there is an interesting account of this activity, prepared especially for TRAFFIC ENGINEERING by ITE member Harry Burns, who is serving as editor of the Manual. As you will see by reviewing Harry Burns' article the Canadian Section is playing a most important part in this project.

"Letters to the Editor" Department

The following letter was received by the editor from Walter H. Blucher, President of the American Institute of Planners and Consultant to the American Society of Planning Officials:

"Dear Mr. Baldwin:

Since ITE is kind enough to provide me with copies of TRAFFIC ENGINEERING, and since I believe that I can profit from studying its contents, I do read the magazine.

I feel compelled to quote the following from the New Testament, Saint Mark 6:4 'But Jesus said unto them, a prophet is not without honor, but in his own country, and among his own kin, and in his own house.' There is a slight variation in Saint John 4:44.

This is in regard to column one, page 169 of the January issue."

The editor has made a resolution to read his Bible more carefully in the future, and so probably has Mr. Barnes the author of the article in the January issue. Did any other readers catch this?

New Publications Received

Two interesting booklets have recently come across the desk of the editor, which deserve at least passing mention. One is from the Associated General Contractors of America and is entitled "Highways — 1956-1969." This is a story of the new highway program and while it will be of particular interest to contractors, it does have a number of interesting features, including tables on estimated funds available under the new Act, estimated material and labor requirements for the new program, and others.

A second document which has been received is a reprint from *Automotive Industries*, entitled "The New America That's Coming." This is a series of editorial presentations by staff writers, summarizing various developments of the highway program and related aspects, including vehicles and service facilities. Particularly interesting are some of the illustrations showing new facilities, in some cases comparing them with older highways.

Also received has been a reprint from *Harper's Magazine* for December

of Robert Moses' article, "The New Super Highways: Blessing or Blight?" Commissioner Moses devotes a substantial portion of the article to one of his pet peeves — billboards. He also points out what he believes to be minor weaknesses in the new Federal Highway Act, some of which will be the subject of considerable attention in months ahead by many highway engineers. The article is interesting reading if you have not seen it.

Traffic Engineering Training In England

A report has recently been received from Dr. T. E. H. Williams of the Department of Civil Engineering at University of Durham King's College at Newcastle, England. Dr. Williams is carrying on a course in highway engineering and traffic studies as a part of the graduate and undergraduate program at King's College, and he has also been responsible for the short courses run in conjunction with the Road Research Laboratories. In October, 1956, eight students enrolled for the long course. Two were International Road Federation scholars, one from Australia and one from South Africa.

A number of U. S. engineers will recall that Dr. Williams made an extended tour through the United States during the summer of 1955.

MOTOR VEHICLE DEATHS AND DEATH RATES

1954, 1955 and 1956

Month	1954	1955	1956	1954–56 Change	1955–56 Change
January	2,816	2,810	2,950	+ 5%	+ 5%
February	2,472	2,319	2,730	+10%	+18%
March	2,503	2,602	2,940	+17%	+13%
April	2,589	2,753	2,920	+13%	+ 6%
May	2,877	3,101	3,160	+10%	+ 2%
June	2,748	2,982	3,280	+19%	+10%
July	3,044	3,350	3,520	+16%	+ 5%
August	3,214	3,586	3,660	+14%	+ 2%
September	3,070	3,446	3,690	+20%	+ 7%
October	3,478	3,918	3,450	− 1%	−12%
November	3,253	3,559	3,700	+14%	+ 4%
December	3,522	4,000	4,000	+14%	0%
Total	35,586	38,426	40,000	+12%	+ 4%

All 1954 and 1955 figures are from the National Office of Vital Statistics. All others are National Safety Council estimates.

Section News

CANADIAN SECTION

From Section Newsletter, Grant Bacchus, Editor.

Ontario Traffic Conference Traffic Training Course

The Ontario Traffic Conference has announced its third annual Traffic Training Course which this year is being held at the University of Toronto from May 13th to May 24th. The course this year is being divided into two departments—Police Traffic Training and Traffic Training for Traffic Engineering Personnel—so that a more intensified presentation can be made. Both courses are under the Directorship of *Professor H. M. Edwards* of Queens University, Kingston, Ontario and the lecturing staff is composed of personnel actively engaged in, or with special qualifications in the Traffic Field, many of whom are members of the Institute of Traffic Engineers.

For details please contact *Mr. D. T. Crosbie,* 116 Castlewood Road, Toronto 12, Ontario.

Possible ITE Convention in Toronto

A number of CITE members in Toronto, including your editor, have been considering the possibilities of promoting Toronto as the site for the ITE convention in 1959 or 1960. If our initial enquiries to the ITE Board of Directors are received favourably we can start on what will be our biggest Local Section project. It may become necessary to have a fund raising campaign or to increase our annual dues temporarily to defray any expenses.

Please contact your editor if you have any suggestions for "selling" the Board of Direction on the Toronto site for a convention.

News Briefs

TORONTO — *Walter Q. Macnee,* our immediate Past President and Chairman of the Joint Committee on Uniform Traffic Control Devices for Canada has been appointed a member of Committee 7J of the Institute of Traffic Engineers. This group is studying signs for the inter-state highway system which is covered by the new federal aid program. Walter's appointment is an indication of the increasing recognition that Canadian Section members are enjoying below the border.

VANCOUVER—Due to his recent promotion to Executive Assistant to the President of the Western Development and Power Ltd., *E. D. Sutcliffe* has found it necessary to resign from our membership. We are sorry to accept *Mr. Sutcliffe's* resignation and wish to thank him for his cooperation during the past years.

BERKELEY CALIFORNIA — We were pleased to receive a letter from *Bob Campbell* who is currently studying in California. *Bob* and his wife June are enjoying their stay in San Francisco and spent the Christmas season on a cruise to Hawaii, spending a few days in Honolulu and New Year's Eve aboard ship.

I am sure *Bob* would enjoy hearing from his many friends and fellow members. His address is 2409 Jefferson Ave., Berkeley 3, California.

OTTAWA—The Canadian Good Roads Association today announced four scholarships, each valued at $2,000, for postgraduate studies in the highway field.

Any young Canadian engineer wishing to take further studies in highway planning, traffic, soil mechanics and transport economics is eligible. Closing date for applications is May 1.

Two of the scholarships — the Union Tractor and the Westeel good roads scholarships—will be awarded for study at the new Highway Transportation Institute to be established next fall at the University of Alberta, first of its kind in Canada.

The third, the Canadian Salt good roads scholarship is for postgraduate study in Canada or the United States; the fourth, the Armco drainage scholarship, is for study in the U. S. only.

For information please contact *Mr. C. W. Gilchrist,* Managing Director, Canadian Good Roads Association, 270 MacLaren St., Ottawa 4, Ontario.

Ralph Borrowman has announced that his address has been changed from 60 Spruce St. to 277 Woodroffe Ave., Ottawa.

METROPOLITAN (New York) SECTION

From Section Newsletter, Ernest A. Boulding, Chairman, Newsletter Committee.
December 4 Meeting Notes

President Quimby welcomed a large number of guests representing various Consultants for the New York Metropolitan Area Traffic Study at the Masonic Club luncheon meeting.

The guest speaker, *Mr. Frank H. Simon,* Executive Director of the Metropolitan Rapid Transit Commission, was introduced by *Michael Dimitri. Mr. Simon* reviewed the function of the Commission, emphasizing that it is responsible for a comprehensive study of the transportation needs of the Metropolitan area and has no authority to take any action nor to participate in rate hearings.

The Commission's first job is to define the problem of communication between and within municipalities of the area. Transportation habits have changed over the years from the use of the efficient rail facilities to the inefficient automobile. Between 1944 and 1954 annual trans-Hudson passengers by auto increased from 57 million to 136 million, while decreasing from 141 million to 77 million by rail.

Communities were not prepared for the deluge of automobiles and the confusion and congestion that resulted were increased by the roads, bridges and tunnels that were built to relieve the congestion.

During that period, the railroads did nothing to retain their patrons, yet the Metropolitan area depends upon mass transportation. The City cannot survive without mass transit, for sufficient volume cannot be accommodated in private vehicles. Part of the Commission's problem is to study ways of making mass transit attractive in speed, comfort and cost.

Upon completion of studies by the Consultants, *Mr. Arthur Page,* the Project Manager, will submit a report to the Commission. It in turn will submit its own report to the Legislatures of New York and New Jersey after publicizing the Project Director's report and holding public hearings.

After a lively period of questions from the floor, the meeting adjourned at 2 P.M.

Metropolitan Member News

Mr. William D. Flye formerly with White Plains Department of Public Works has accepted the position of Traffic Engineer in Riverside, Calif.

Welcome!

To *Mr. Charles J. Tilden,* Honorary Member, recently returned to this country from an extended assignment in Australia.

Welcome!

To *Mr. John B. Ecker,* Member, recently transferred to New York with W. C. Gilman & Co., Engineers from Washington, where he was with the D. C. Transit System Inc.

Congratulations!

To *President Quimby and wife, Betty.* Gordon and Roger arrived December 22. Warren and the three boys now have the majority vote over Betty and the two girls.

To *Mr. Maynard A. Beebe* on his appointment as Director of the Bureau of Highway Planning, N. Y. State Department of Public Works effective December 20, 1956.

To *George R. Roy* on his promotion from Assistant Highway Planning Engineer to General Planning Analyst, Port of New York Authority.

SOUTHERN SECTION

News from the Section Newsletter, John T. Hanna, Secretary-Treasurer.

Kenneth Smith, City Traffic Engineer of Alexandria, Virginia, has proposed to the Traffic Board that the time for the take-in and release of school students be changed from 9:00 a.m. to 9:30 a.m. for take-in and from 2:00 p.m. to 2:30 p.m. as the case may be.

He writes, "My reasoning for this recommendation is this 30 minute change will not only provide for increased safety of these students in going to school in the mornings as it will remove them from having to be in conflict and opposing the heavy vehicular traffic which is on the streets, particularly the arterial highways. Second, it will enable public transportation to better provide such special services that is demanded in transporting students to both public and parochial schools. Third, the design of our signal systems which provide special sequence for pedestrian crossings can be better utilized to full advantage of all concerned. It would lessen interruption to normal traffic flow during peak traffic hours thereby in effect increasing street capacity by lessening the demand for the all-RED or pedestrian interval. This would also be true at non-signalized intersections where the school crossing guards or Police officer controls traffic manually.

"Fourth, it would enable a better determination of new signal locations one that would best serve a given area or a multiple purpose rather than school student safety as the paramount consideration.

"I am sure you are aware of the many demands that are not only made of the Department of Traffic but the Department of Police to provide either traffic control or man power. This has not only been a very costly demand in the way of mechanical equipment but has greatly handicapped the Department of Police in man power during the hours when the demand for police services is greatest.

"We, as in many cities, have been plagued for a long time with just how to control vehicle speed in school zones, particularly when school is recessing or taking in. As you no doubt know, and I am sure it is true in many cities, that the requirement to reduce speed to 15 mph is only necessary when school is actually recessing or taking in and not applicable at any other time during school days or on Saturday, Sunday or holidays.

"We, in Alexandria, had given this matter serious thought and had used all of the devices known or thought of in the field of traffic control and found none of them serving the purpose for which they were intended. We installed two of the flashing signals (Winko-matic) mounted on a sign stating "Speed Limit 15 M.P.H. When Flashing" and installed them on one of our major thoroughfares where numerous complaints had been received relative to speeding vehicles at the time school was recessing or taking in. During the first week that these signals were installed we conducted several speed checks, using an electrical timer device. The average speed of vehicles along this street was in excess of 30 M.P.H. although the street was posted 25 M.P.H. We used the timer one hour before the electrical flashing sign was to come on, and also the one hour that the sign stayed on. The reduction in speed on the greatest majority of the vehicles was amazing. Out of one hundred vehicles checked there were only five that exceeded 20 M.P.H.

"We are so pleased with the results obtained from the use of this type of control that we have ordered a sufficient number to be installed in the immediate vicinity of schools and also where there is a major school crossing of an arterial highway.

"Our situation in the City of Alexandria may be a little different from that of many cities and that is due to the fact that we are in the Metropolitan Area of Washington and must not only contend with heavy inter-state traffic traveling through the city but also the many people who only live here temporarily by virtue of being assigned to the military or holding other government positions in this area.

"We operate our signals on a calendar type time clock and they come on at 8:00 to 9:15 a.m. and from 2:00 to 3:15 p.m. The length of this time is necessary because of the difference in the hours of take in time and recess time of our school system."

Marble J. Hensley, Director of Traffic & Planning, Chattanooga, Tennessee writes:

"During the coming year we must attempt to establish standards for Walk-Wait lights and we are tentatively proposing a new ITE arrow. I feel that our committee must hold a meeting some time in the early spring; I believe that the best date for such a meeting would be March 2nd during the Southern Safety Conference in Richmond so that we could have our committee meeting the day before the Southern Section meeting and possibly higher attendance and create more interest in this meeting. We would also like to get the reaction of all the members present during our Southern meeting. I believe that the main thing would be to install two or three different shaped arrows at one installation

and compare their visibility both day and night. We would also install two or three different types of pedestrian signal indications for the membership to view."

WESTERN SECTION

From Section Newsletter,
Robert E. Dunn, Editor.

SEATTLE

CITY OF THE MONTH

By Earl Succo
Public Relations Assistant
Seattle Traffic Engineering Division

Several traffic engineering techniques have been devised to expedite the movement of large volumes of traffic on the more than 20 miles of one-way streets recently installed in the Central Business District of the City of Seattle. The ingenious approach to the problems of urban traffic control by the traffic engineering staff headed by *E. E. Lewarch,* has led to this feature article selecting Seattle as the "City of the Month."

The problem of preventing motorists from turning the wrong way onto a one-way street has been effectively reduced by the use of supplementary traffic signs 18" x 24" in size, mounted at a 45-degree angle on a parking meter post. These signs are installed in the street in such a manner as to be clearly visible to the driver and so as to not interfere with pedestrian movement. Vehicular damage to these signs has been so slight during their first year of operation that they are being contemplated for use on the entire one-way grid system.

The loading of passengers on transit coaches was recently expedited by the construction of a special loading zone on a one-way street in the heart of the Central Business District. This particular location handles 959 coaches in an eastbound direction each week day, with a concentration of 92 coaches during the peak-hour from 4:30 to 5:30 p.m. The passenger loading island is 64 feet in length and seven feet wide. It was installed in the second traffic lane to permit five transit coaches to load simultaneously. The curb lane is 11 feet wide and is restricted for transit coach use only. Transit officials claim that there has been a one-third reduction in passenger loading time with this new procedure.

Back-in-angle parking is another innovation developed by the Seattle City Traffic Engineering Staff to eliminate the "runaway" type of accidents prevalent on city streets having steep grades and parallel parking. The parking stalls are marked at a 70-degree angle to facilitate the back-up movement. Each parking meter has a sign with the legend "Back-in-Parking Only." A recent transit system strike at the beginning of the Christmas shopping season led to a wide spread application of this type of parking on the non-arterial central business district streets to handle the increased passenger car traffic. *Lewarch* reports that the motorists took to the practice like "water takes to ducks" without any special signing. In fact, the emergency style was so widely accepted that one non-conformist who parked normally in a parallel metered stall was given a ticket for occupying space enough for two vehicles.

Seattle also won the grand award for cities over 100,000 population in the 17th annual pedestrian protection contest sponsored by the American Automobile Association. The award was based on a record low of 38 traffic fatalities during the year 1955. A good accident record file, fine legislative and enforcement programs, and top-flight engineering contributed towards the well deserved award.

Personals

Jake Young is the travelingest man in the Sacramento group. As chairman of the AASHO Design Committee, he has held meetings this year at Portland, Atlantic City, St. Louis, and Pittsburgh, giving out the word on how to build freeways. Known as *"One-Fact" Young,* he always has one more fact to lay on the table than anyone else.

With the aid of *Charlie Zell, Mel West* has opened the Bottom Drawer and pulled out the exact number (eight) of lanes required in 1975 on the California Interstate Highway System.

Jim Reading reports that the first phase of the downtown one-way street system is now in operation. The weekend following the convention was spent in preparing the streets, and with a few sleight-of-hand tricks on Monday, the switchover was made smoothly. *John Tsiknas, Don Robbins* and *Hal Durham* were the team that handled this successful evolution.

In addition, several surveys and studys have been completed by the City of San Diego Traffic Engineering staff, in cooperation with *Ed Hall's* group from Transportation Research. These included a complete survey of all traffic control devices, which will be put on punched cards for a running inventory system, a downtown cordon count, downtown parking usage survey, and downtown parking duration study.

Ed Hall is proud to announce that the assignment of 1952-53 O-D trip data to the Major Street and Highway Plan is complete. The San Diego Metropolitan Area Transportation Study made this assignment simultaneously with the State Division of Highways. Both studies will be compared and analyzed. *Keith Gilbert* handled this assignment for *Ed* and is now beginning work on a process that will yield future trips for assignment to the same plan.

Elmer A. Clees, Assistant Work Control Engineer for the Washington Department of Highways, was recently highly honored by having conferred upon him the Legion of Honor of the Order of De Molay. This is the highest honor that the Order can confer upon a former member and is in recognition for one's leadership among youth and achievement in one's profession. *Clees* is a Past Master Counciler of the Olympia Chapter and also is holder of the Order's degree of Chevalier.

Maurice Ri Chey, Traffic Engineer, Montana Highway Commission, and a crew from the Department are presently working on intersections and interchanges for the Interstate System. He has another two-man crew starting on what is hoped will be a Montana-wide speed zone survey program. *Maurice* also reports he is in the legislative field and attended a meeting of the Council of State Governments in regard to the Uniform Traffic Code held in Reno the 1st of December. There is to be another meeting in January in San Francisco. *Senator Collier,* Chairman of the Subcommittee on the Legislative Problems of Highway Operations of the Council, has requested *Maurice* to submit a proposal for modification of Section 11-602 of the Uniform Code. This section pertains to "turning on a curve or crest of grade prohibited" to an increased distance over the present 500 feet.

Robert O'Connell, Traffic Engineer, Wyoming Department, reports that his Assistant Traffic Engineer, *Don Bass,* is now attending the Yale Bureau of Highway Traffic in New Haven, and is looking forward to some helpful suggestions in June. Don is a graduate of the University of Wyoming and was recently married.

Gerald Matthews, Planning Engineer, State Road Commission of Utah, reports the Planning Department is in the initial phase of two studies required by the 1956 Federal Aid Act—The Accident Cost Study and the Truck Characteristic Study. Because of these studies, it has been necessary to augment Planning personnel by 100%. The report on Utah's 1956 Traffic Volumes has been published and is available to those interested. *Jerry* also reported that much of the information compiled by his Department in the past several years is now becoming invaluable in making engineering decisions in the design of the Interstate System.

During the ITE convention in San Francisco, a building along U. S. 66 in downtown Albuquerque collapsed. To protect it, several braces (telephone poles) were set in the middle of the street to stop any further ruin until the damage could be corrected. The loss of half the street necessitated designating a portion of the street one-way.

The occasion was used to good advantage to show the populace how much better the street would operate as a one-way street than as a two-way. *Francis C. Burton* was disappointed when the contractor was able to get the main street cleared, as he had been trying to designate Central Avenue as a one-way street through the downtown area for the past year. (Try something more drastic next time *Francis* —it took an earthquake to get one-way streets in Olympia. Ed.)

A recent survey of accomplishments for the past year in Albuquerque showed considerable improvements. Work has been progressing so steadily that the amount of improvements was slightly amazing. The Street Lighting Program shows the installation of new residential street lights at 600 intersections and 400 mercury vapor arterial street lights on 4 miles of streets and around 10 major intersections, 4100 signs of various types were installed, 10 miles of arterial streets have been constructed and 8 miles to be let to contract before Christmas. Twenty-eight new traffic signals were installed.

A Traffic Survey in cooperation with the National Committee on Urban Transportation is progressing very satisfactorily. The IBM Section of the Finance Department is worrying with punching well over 100,000 cards before the analysis of the information can be started.

The Phoenix Traffic Engineering Division is engaged in quite a controversy at the moment—whether or whether not to install a 'scramble system.' *Chuck Haley* feels that the 'scramble system' will not be applicable to Phoenix because Phoenix has 68-foot downtown streets, and because of the particular type of movement through the downtown area that must be provided for. The City Council, at the suggestion of the Downtown Merchants, sent *Chuck* to Denver, and their assistance was greatly appreciated. While in Denver, *Chuck* had a chance to have lunch with *Al Pepper*. (Seems like a good controversial subject for a "Letters to the Editor" column, send in your views—Ed.)

Phoenix also has a new Assistant Traffic Engineer. His name is *Arnold A. Johnson. Arnold* completed his Masters Degree requirements in traffic and transportation at the University of California at Berkeley.

Bob Glenn, after recovering from the strains of the general chairmanship of the ITE convention, is now busily preparing the program of the Ninth California Street and Highway Conference, to be held in Berkeley from January 23 to 25, 1957.

The Automotive Safety Foundation will submit its long-awaited report on San Francisco Traffic Administration, about January 1. The Bay Area members are hopeful that it will mean putting San Francisco traffic engineering authority where it should be and giving *Ross Shoaf* enough moola to do the job that is needed here. I believe we are the last city above 500,000 with traffic engineering authority still under the police. New York, Los Angeles and Baltimore finally made the change, leaving San Francisco as the last major city in this category.

The businessmen in Frisco put the pressure on the City to effect more one-way streets. Besides looking into this, *Ross Shoaf* says his department is pretty busy checking to see that housing developments correspond with the new ordinance requiring one accessible parking stall for each living unit. Ross states that in too many cases the area is provided but there is a column in the middle of it (in apartment house and other covered area parking facilities).

Among the graduate students at the ITTE this year is *R. C. (Bob) Campbell,* recipient of the Canadian Good Roads Federation Scholarship. *Bob* is an ITE member from Toronto.

Rapid transit has been getting a lot of attention in the Bay Area in 1956. *Harmer Davis* is serving on a special committee of the local section of the ASCE which is presenting a report on the proposed system this month.

Bob Holmes paid the Bay Area a visit earlier this week, getting acquainted with the Geneva Division of U. S. Steel, his new employer. His title is Highway Construction Representative, Market Development Division, U. S. Steel Corporation, Pittsburgh, Pa.

Hank Evans is going to be pretty busy for the next several months developing a freeway study for the City of Richmond. His firm has been hired to analyze the need for a connector between the new Richmond-San Rafael Bridge and U. S. 40 to the north.

Arthur Jenkins has just been retained by the San Francisco Public Utilities Commission to act as traffic engineer on the San Francisco Airport expansion.

J. Czizek is agog over the new parking program just submitted by Coverdale-Colpitts. It provides for 277 stalls in four parking lots, to be expanded to 1,836 stalls when garages are erected sometime before 1970. It is based on a self-liquidating financial plan.

Jack Faustman is undertaking a nice design job in connection with parking and traffic circulation for the new $44,000,000 Kaiser Center in Oakland.

The Los Angeles Area had a very successful meeting on Wednesday, November 14 at the Clark Hotel. A total of 72 people attended and enthusiastically welcomed National President *J. Carl McMonagle. Carl* gave an interesting talk before the group along with *George Webb,* the Traffic Engineer of the California Division of Highways, who presented some pertinent information relative to freeway accidents.

The City of Los Angeles has some new traffic engineering personnel, including *Bob Warr,* A "WITE" transfer from Seattle, and *Bob Colpitts,* formerly of Tacoma. *Bob Warr* is in the Signal Division, and *Bob Colpitts* is assisting *Jim Hardy* in the Central District. Two new traffic engineers have been appointed to be in charge of geographic districts of L. A. *Hugh Gilman* is the new traffic engineer for the Western District, and *Louis L. Clearwater* has a similar position in the Southern District. *Jerry Skiles* is now the Senior Traffic Engineer in charge of Operations.

The Highway Planning Division at Olympia, under *Squeeg Glaze,* published a comprehensive analysis of a proposed toll bridge across Lake Washington as a review of a DeLeuw, Cather and Company report on the same subject. Much night and weekend work was required by the thinned ranks of the Planning Division to meet the scheduled deadline. While directing the analysis and writing the report *Johnny Mladinov* was commuting between Seattle, where wife Barbara was hospitalized, Tacoma, where the twins were housed, and Olympia, where the analysis was taking place, taking time out to be nurse, cook, and bottle washer, catch the flu, and buy a new house!

Bob Hansen is deeply immersed in electronic computers. He tells a story to illustrate that you can head up a computer organization and still not know anything about electricity or electronics.

Bob installed turn indicators on his car several years ago but through some electrical quirk (!) they never worked correctly. After pondering the problem for 2 years, Bob summoned up the courage to try again. Finishing the job, finding the turn indicators working correctly, and proud of his new found abilities, Bob drove into the garage, put on his brakes and lo and behold the dash lights lit up brightly—but no stop lights! Bob expects to have the problem resolved on the computer within the next 2 year period.

Tom McLeod, Associate Traffic Engineer on *Rex Still's* staff, is attending a 2 week school on electronic computers.

Gerry Cysewski recently finished a masterful report on a regional shopping center in Honolulu, Hawaii. Gerry is on the go so much these days it is hard to get him to light long enough to see if his new life agrees with him.

Letters to the Editor

Santa Fe, Mexico
January 17, 1957

Sir:

The Route Numbering Committee of the A.A.S.H.O. is studying the problem of designing a distinctive route marker for the interstate system and has asked for suggestions. Offered here is a discussion of some of the factors involved, followed by a few conclusions and recommendations.

The principal purpose of a distinctive marker would be to help motorists find the interstate highways easily, especially in urban areas. Possible means for distinguishing the interstate markers are legend, shape, color, size and position.

Legends most commonly thought of for route markers are numbers. How-

ever, a set of new route numbers for the interstate system could be confusing to motorists because of the many state and federal route numbers already in existence.

Interstate routes could be identified by letters. This would allow up to 26 route designations by single digits, while at the same time avoiding confusion with existing route numbers.

On many informational and directional signs the route designation is written out, as "U. S. 66" or "STATE 18." On signs such as these, interstate numbers would have to carry an additional word designation such as "INTERSTATE 66," where route letters would appear as "U. S. D" or "U. S. CF."

Although the letter designations would not allow separation of north-south and east-west routes by odd and even numbering, it is doubtful whether motorists would know the difference.

In a sense the interstate highways will be improvements of existing highways by reconstruction or relocation. Much of the interstate mileage will be built on existing U. S. highway alignment. If numbers are used for interstate routes, why not use the existing U. S. number and add an "I" prefix? This would eliminate the need for one extra route marker where the old U. S. highway and the new interstate route follow the same alignment.

It is doubtful whether "U. S." or state names are of much value on federal route markers. Already New Mexico has dropped the state name from U. S. shields and it is doubtful whether even the "U. S." lettering serves any purpose since the shape of the shield itself means "U. S."

Shape is an effective way to distinguish a new sign. But is it necessary or even desirable to use a new shape for interstate markers? The interstate routes will be federal highways and the established shield shape seems most suitable.

The usefulness of route marker shapes is limited. For example, New Mexico does not even use marker shapes on important junction and directional signs. Word legends such as "JUNCTION — U. S. 66 — AHEAD" and "U. S. 285 (with a directional arrow)" are used. It is felt these signs are more effective than ones bearing marker symbols because they are simpler and their lettering is larger. On signs such as these the interstate routing would have to be identified by legend alone.

If interstate highways are identified by letters instead of numbers, the shield shaped markers should cause no confusion. See Figure 1.

If numbers are used, an "I" prefix for the route numbers might be enough to distinguish the interstate route numbers without using a different marker shape. See Figure 2.

If new interstate numbers without letters are used, a new route marker shape will be necessary. There are many possible shapes but to be efficient they should approximate either a square or a horizontal rectangle. The "I" shape which Mr. Burch suggested could be made more efficient by exaggerating its width, as in Figure 3.

Color is an effective means of distinguishing one sign from another, but there are only five or six colors besides black, white, yellow and red which could be used as standards in a national signing system. If one of these colors is set aside for interstate markers it will be lost for other and probably more important purposes.

For instance, it is likely that a national standard will be set up to separate cardinal directions with color. Even this would require four colors. It would seem that color is potentially too important to be used to distinguish interstate markers.

Relative *size* could be used to distinguish interstate markers by having interstate markers always larger than other route markers nearby. But it would be impractical to set a fixed minimum size for interstate markers because several different sizes will be

(Continued on page 302)

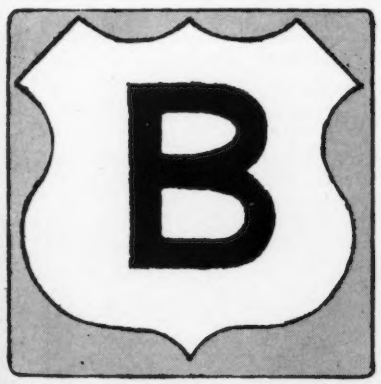

Figure 1.
Shield bearing letter designation.

Figure 2.
Shield bearing number designation with "I" prefix.

Figure 3.
"I" shape in horizontal rectangle.

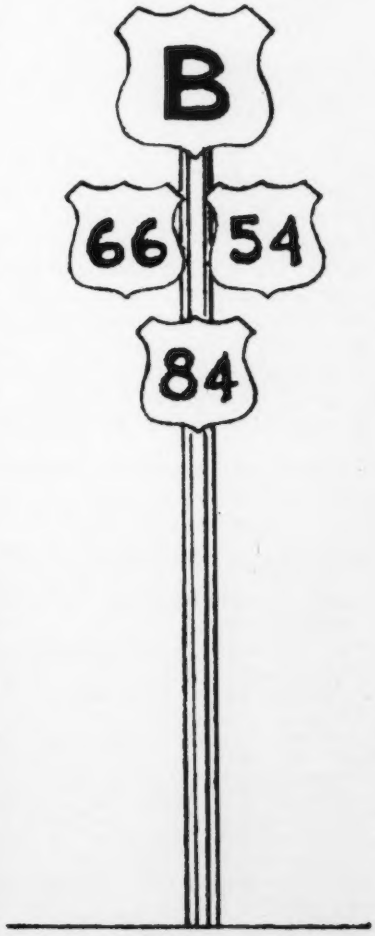

Figure 4.
Separation of interstate marker by size and position.

VOLUME-DENSITY METHOD

(Continued from page 262)

6. The interval of the density count may be varied to suit accuracy requirements and available manpower. At peak flows, when more manpower would normally be required for the density count, the time interval of the count may be lengthened instead. By this procedure there is little change in accuracy over the off-peak period. Moreover, no additional manpower is required to count density during the peak period. A study of Table 1 shows this quite well.

Limitations of the Method

1. The observers must usually be at a slight elevation. From 10 to 20 feet above the pavement is sufficient, depending principally on the density of traffic and the percentage of trucks and buses. Studies have been satisfactorily completed, however, with the observer only 5 feet above the pavement.

2. The observers must train themselves to count the density more or less "instantaneously." This may be done by first noting a particular car as it enters or leaves the study section, as for example a green Ford. Then the density count is quickly begun at the other end of the study section and continued until the "green Ford" has been reached.

3. Counts at time intervals such as 10, 15, 20, or 30 seconds are easy to make. Traffic signals employing even quarter-minute cycles such as 45, 60, or 75 seconds, however, require that the time interval be 14 or 16 seconds in order to spread the density counts throughout the cycle. Under those circumstances a timer must be constructed so that the observer may easily use the required time interval. Another alternative is to count density at 0, 15, 30, 45 seconds on the watch, then at 5, 20, 35, 50 seconds and finally at 10, 25, 40, 55 seconds. This sequence is repeated, giving a good distribution of density determinations throughout the signal cycle.

4. At very low volumes, timing of individual cars with a stop watch would probably be a more accurate method.

5. Only average travel times may be determined with this method. For some purposes, it may be desirable to know the distribution of travel times for all vehicles.

Figure 3.
When the approach on the right was operating at two-thirds of its possible capacity, 19 minutes of delay accrued to all moving traffic for each hour that each parking space was in use.

Summary

The volume-density method of determining travel time is both simple and accurate. For the usual intersection, travel times may be measured to within an accuracy of 5 to 10 percent. Only 1.2 man-hours of field and office time are required to measure the travel time on a single intersection approach during one hour. Required equipment includes a pencil, paper, hand counter, and wrist watch.

Coming Events

March 17-21—AMERICAN SOCIETY OF PLANNING OFFICIALS—
Annual Planning Conference, Sheraton-Palace Hotel, San Francisco, Calif. Contact: ASPO, 1313 E. 60th St., Chicago 37, Illinois.

March 18-19—MASSACHUSETTS SAFETY CONFERENCE—
36th Annual Conference, Hotel Statler, Boston, Mass. Contact: Mass. Safety Council, 31 State St., Boston 9, Mass.

June 3-7 — AMERICAN SOCIETY OF CIVIL ENGINEERS—
National Convention, Statler Hotel, Buffalo, N. Y. Contact: ASCE, 29 W. 39 St., N. Y. C.

June 25-27 — INSTITUTE OF TRAFFIC ENGINEERS, WESTERN SECTION —
Cosmopolitan Hotel, Denver, Colo. Contact: Jack Bruce, Traffic Engineer, City & County Bldg., Denver 2, Colo.

September 9-13—ILLUMINATING ENGINEERING SOCIETY —
National Technical Conference, Biltmore Hotel, Atlanta, Ga. Contact: IES, 1860 Broadway, N. Y. 23, N. Y.

September 23-27 — INSTITUTE OF TRAFFIC ENGINEERS—
Annual Meeting, Statler Hotel, Detroit, Mich. Contact: ITE, 2029 K St. N.W., Washington 6, D. C.

October 13-15 — AMERICAN INSTITUTE OF PLANNERS —
Annual Meeting, Congress Hotel, Chicago, Illinois.

October 14-18—AMERICAN SOCIETY OF CIVIL ENGINEERS—
National Convention, Statler Hotel, New York City. Contact: ASCE, 29 W. 39 St., N. Y. C.

October 21-25—NATIONAL SAFETY COUNCIL—
Annual Safety Congress & Exposition, Congress, Conrad Hilton and other Hotels, Chicago, Ill. Contact: NSC, 425 N. Michigan Ave., Chicago 11, Illinois.

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. . . says Police Supt. A. G. Kendall of Fredericksburg, Virginia

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"During the 9 months following the installation, the accident rate at this intersection has been lowered to .66 accidents per month. This is a reduction of 51.5%.

"I would say that a vital part in this reduction was played by the greater visibility of Crouse-Hinds 12" Signals."

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Reference Notes

PRE-LINING FOR BETTER STREET MARKING

by Edwin F. Colby (Assoc. Mem., ITE)
Assistant Traffic Engineer, Providence, R. I.

PROVIDENCE, like many of the older eastern cities, has its share of narrow streets with old and irregular curb lines and alignment. A serious problem that had always faced our paint crews was obtaining straight and regularly spaced paint lines by measuring offsets from the curb. Usually, after snapping chalk lines on the premarks measured from the curb, the result was a series of short tangents with the direction of the line changing within the block.

In order to join these premarks into a straight line as a guide for the paint machine, the prelining device shown in Figures 1 and 2 was developed in our department several years ago. This device was propelled by a vehicle behind connected with a bar and trailer hitches on both ends. It was ridden and steered by the operator, who controlled the flow of paint and who lined up the premarks ahead, thus making a continuous smooth lane line or center line. As seen in Figure 1, several of the marks are to the left of the line, but ahead there would be marks to the right of the line, thus balancing the effects of the irregular curbs. In other words, the preline ends up being a kind of centroid of the premarks.

This device worked very well, except that combined with the car behind the total length was about 45 feet, which resulted in somewhat difficult operation in traffic. It was very uncomfortable to ride, and there was quite an element of danger in operation.

Figure 1

Figure 2

After bumping a couple of cars at the start of the painting season in the spring last year, our operations engineer, Clint Adams, set to work to try to improve our prelining method. His answer to our problem consisted of a standard automobile and keeping the prelining rig all contained in this one unit.

Figure 3

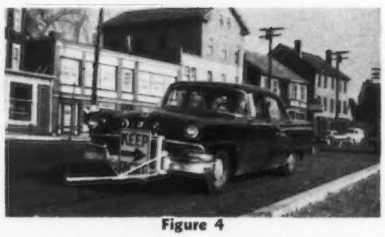

Figure 4

As shown in Figures 3 and 4, a detachable pipe frame was attached to the front of the car. Incidentally, this frame has flashing red lights and a "Keep Right" sign, and there are also flashing red lights in the rear of the vehicle. The vertical pipe in the front of the frame is in line with the steering wheel post of the vehicle and with the paint that is applied through the hose attached to the frame in the rear.

This hose leads up through the trunk into the rear seat and is attached to a five-gallon bucket in which the material, consisting of half aluminum paint and half gasoline, is contained. Through two valves the flow of paint is regulated by a man in the back who faces out the rear window to check on the paint flow and to notify the operator whether or not he is over the premarks. The operator drives the vehicle and lines up the premarks ahead. Practically the only guidance he needs from the man in the rear is at the start of an operation to be sure that he is positioned correctly in the seat to have his eyesight in line with the steering post and the pointer on the front.

Figure 5

Figure 6

We have found this device to be a great improvement over our original preliner. It is advantageous because we can now operate with much more flexibility and maneuverability. It is a safer operation, since the man doing the guiding is not as exposed as before. It is very easy to use and particularly good on running in curves.

Figure 5 and 6 show a street in the process of being prelined with the automobile. Figure 7 shows the same street after it had been painted. Our paint operators use the preline as their guide to follow in applying the paint and have found it much easier and faster than the old method of snapping chalk lines or trying to guide on the premarks alone.

Figure 7

Membership Applications

The following applications have been received since the list of applicants published in the February issue.

APPLICATIONS FOR TRANSFER

LAWTON, Lawrence
Director of Traffic Planning, Department of Traffic, 100 Gold Street, New York 38, New York. January 23, 1957 for MEMBER grade.

RUDY, Burton M.
Senior Highway Engineer, Connecticut State Highway Department, Traffic Division, 284 Sheldon Street, Hartford, Connecticut. January 25, 1957 for ASSOCIATE grade.

NEW APPLICATIONS

BERKOWITZ, John
Assistant District Traffic Engineer, Washington State Department of Highways, 6431 Corson Avenue, Seattle 8, Washington. January 24, 1957 for JUNIOR grade.

CLARK, Neil B.
Traffic Engineer II, City of Glendale, 120 North Howard Street, Glendale 6, California. January 11, 1957 for JUNIOR grade.

COTTINGHAM, Kenneth E.
Assistant Traffic Engineer, Seattle Engineering Department, Traffic Division, 401 County-City Building, Seattle 1, Washington. January 22, 1957 for JUNIOR grade.

FREED, Arthur
Traffic Engineer, Westchester Co. Dept. of Public Works, County Office Building, White Plains, New York. January 29, 1957 for JUNIOR grade.

GFROERER, William E.
Senior Assistant Traffic Engineer, Department of Traffic Engineering, City Hall, 6th & Jefferson Streets, Louisville, Kentucky. February 7, 1957 for ASSOCIATE grade.

KAHOE, Edwin M., Jr.
Assistant Director of Traffic, 413 St. Paul Place, Baltimore 2, Maryland. January 11, 1957 for JUNIOR grade.

KUDLICK, Walter
Highway & Traffic Engineer, Edwards, Kelcey & Beck, 3 William Street, Newark, New Jersey. January 17, 1957 for ASSOCIATE grade.

McLEROY, Charles E., Jr.
Traffic Engineering Aide, Traffic Engineering Department, 916 Texas Avenue, Lubbock, Texas. January 15, 1957 for JUNIOR grade.

NOWELL, Samuel G., Jr.
Junior Traffic Engineer, The H. K. Ferguson Company, 1783 East 11th Street, Cleveland 14, Ohio. January 23, 1957 for JUNIOR grade.

O'BANNON, Donald H.
Associate Traffic Engineer, Department of Traffic Engineering, City Hall, 6th & Jefferson Streets, Louisville, Kentucky. January 18, 1957 for JUNIOR grade.

Yearbook Changes

BAHN, Adoph, Jr. (Associate)
Associate; Parsons, Brinckerhoff, Hall & MacDonald, 924 Bankers Mortgage Building, Houston 2, Texas.

BARNETT, Norman C. (Associate)
Traffic Engineer, Palmer & Baker, Inc., P. O. Box 10096, New Orleans, Louisiana.

BILLION, Charles E. (Associate)
Principal Civil Engineer, New York State Department of Public Works. SEND MAIL: 820 Park Avenue, Albany 8, New York.

BOULDING, Ernest A., Jr. (Junior)
Principal Engineer, Safety, Bureau of Traffic Safety. SEND MAIL: 30 Lincoln Court, Greenwood Village Annex, Trenton 9, New Jersey.

COMISKEY, John R., Jr. (Associate)
Director, Bureau of Safety, Pennsylvania Department of Highways, Room 420, North Office Building, Harrisburg, Pa.

CROMMELIN, Robert W. (Junior)
Traffic Engineer, San Leandro. SEND MAIL: 3065 Thornwall Lane, Hayward, California.

DOWD, Allen J. (Junior)
Associate Engineer, Wilbur Smith & Associates. SEND MAIL: 255 Bradley Street, New Haven, Connecticut.

GILBOA, Israel (Junior)
Traffic Engineer; DeLeuw, Cather & Company, San Francisco. SEND MAIL: 613-B South Humboldt Street, San Mateo, California.

GREEN, John F. (Junior)
City Engineer. SEND MAIL: East Lake Road, R.F.D. 4, Danbury, Connecticut.

KEITH, Robert A. (Associate)
National Capitol Planning Commission, Washington, D. C. SEND MAIL: 7910 Chelton Road, Bethesda 14, Maryland.

KELL, James H. (Associate)
Assistant Research Engineer, Institute of Traffic & Transportation Engineering, University of California, Berkeley 4, California.

LEISER, Ervin R. (Associate)
Deputy Traffic Engineer, Bureau of Traffic & Engineering & Electrical Services, Department of Public Works, City Hall, Room 804, Milwaukee 2, Wisconsin.

LORENTZEN, Kay (Member)
Traffic Engineer; DeLeuw, Cather & Company, 150 North Wacker Drive, Chicago, Illinois.

MACDONALD, Bruce B. (Associate)
Traffic Engineer; Roy E. Pratt, Consulting Engineer, Springville, New York. SEND MAIL: (until 5/1/57): 656 7th Avenue North, St. Petersburg, Florida.

OSBORNE, Henry W. (Member)
Traffic Engineer & Advisor, Division of Safety, Buffalo. SEND MAIL: 2000 Sheridan Drive, Kenmore 23, New York.

PERKINSON, H. R., Jr. (Associate)
Assistant Traffic & Planning Engineer, Virginia Department of Highways, 1221 East Broad Street, Richmond 19, Virginia.

PLATT, Fletcher N. (Affiliate)
Manager, Traffic Safety & Highway Improvement Department, Ford Motor Company, The American Road, Dearborn, Michigan.

REEDER, Earl J. (Member)
5855 S. W. 97th Street, Miami, Florida.

RUDY, Burton M. (Junior)
Senior Highway Traffic Engineer, Traffic Division, Connecticut State Highway Department. SEND MAIL: 57 Linbrook Road, West Hartford, Connecticut.

SEGOE, Ladislas (Member)
Owner, Ladislas Segoe & Associates, 811 Gwynne Building, Main Street at 6th, Cincinnati 2, Ohio.

SIMOFF, Abram (Associate)
Parking & Traffic Consultant, 14 North Munn Avenue, East Orange, New Jersey.

SYREK, Daniel (Associate)
Data Reduction Specialist, Air Pollution Control District. SEND MAIL: 1756 Notary Drive, Los Angeles 26, California.

TREBLE, G. W. (Associate)
Traffic Engineer, New York State Department of Public Works, Buffalo. SEND MAIL: 512 Newton Road, R.D. 1, Hamburg, New York.

VIVES-MELENDEZ, Juan F. (Associate)
Civil Engineer IV—Chief, Planning & Programming, Traffic Bureau, Department of Public Works. SEND MAIL: 113 Las Flores Street, Santurce, Puerto Rico.

WATSON, Frank L. (Junior)
Traffic & Signal Engineer, Traffic & Transportation Department, 702 City Hall, Houston 2, Texas.

WHISTON, Edward G. (Junior)
Highway Engineer, Cook County Highway Department, Chicago. SEND MAIL: 624 Kenilworth Street, Grayslake, Ill.

WOODLING, Herbert B. (Member)
Traffic Engineer, 902 Municipal Building, Akron 8, Ohio.

WOOLMAN, Stanley (Associate)
Highway Planning Engineer, U. S. Bureau of Public Roads. SEND MAIL: 118 Fleetwood Avenue, Albany 9, New York.

YOUNG, Thomas E. (Associate)
Assistant Traffic Engineer. SEND MAIL: 1585 Wittekind Terrace, Cincinnati 24, Ohio.

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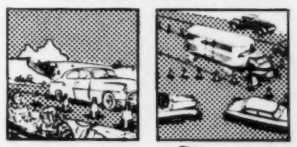

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Reflective pavement markings work night and day to give clear, distinct long-range visibility and meaning to needed lines and symbols. They define paths or regulations that the motorist can quickly and easily follow. They give you an important and basic method of increasing safety and improving traffic flow on any street or road. But if the lines do not hold up well enough, if they become worn, dirty or obscured, they can cause trouble.

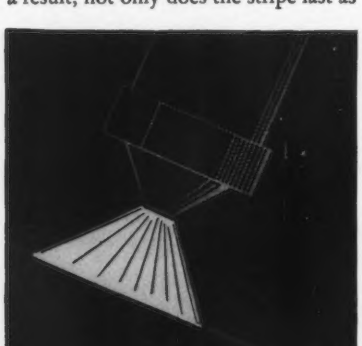
New "Centerlite" Compound gives you centerlines that stand out 24 hours a day with uniform reflectivity that lasts the full life of the stripe. It's the best buy for your pavement marking dollar.

The best costs less

That's one good reason your standards for judging performance of pavement marking materials must be high. Another reason, of course, is cost. But, happily, you can now combine these two desirable factors because pavement striping is one place where the best performer costs you less to use. The facts prove it. The facts prove you'll get the best performance at lowest cost when you use *pre-mixed* new "Centerlite" Reflective Compound . . . with the reflective beads right *in* the paint. Let's look at a few reasons why.

Pre-mix advantages are built-in

Take durability. Since most striping is done only once a year, doesn't it make good sense to use the marking material that will give you the best performance over the longest period of time? "Centerlite" Compound by actual on-the-pavement tests, lasts up to 3 times as long as other types of reflective striping. Why? Because the better, stronger film characteristics of "Centerlite" Compound hold the beads in a tight grip . . . they don't flick out easily. As a result, not only does the stripe last as much as 3 times longer, but color and reflectivity of the line also stay at a higher level.



New "Centerlite" Compound gives you easy, one-step application. Pre-mix reflectivity stays uniform on superelevated sections.

To further illustrate the point, take floor coverings. Color and design in an inlaid linoleum are as deep as the linoleum itself, while color and design of ordinary linoleum are only on the surface. Obviously, as the surface wears, the inlaid linoleum will hold its color and design. The other will not. The inlaid covering gives you a floor that looks better longer, wears longer . . . and gives you a big advantage in long run economy. "Centerlite" Compound is like the inlaid type . . . it costs you less in the long run.

Pre-mix application advantages

The laid down cost of a line of "Centerlite" Compound is less than that of other reflective striping types. Because the beads are already mixed throughout the paint, you only have one item to order, one item to store, one item to handle and only one application step. You apply striping and beads in one easy, fast pass. Practically every striper can handle "Centerlite" Compound nicely without clogging the gun, without settling in the tank, and without extra gun wear.

On superelevated sections or on a flat plane, the stripe is reflective from edge to edge and throughout its length. There is no application problem even on windy or humid days. No worry about synchronizing auxiliary equipment.

New "Centerlite" Compound is extra fast drying, too. Now, traffic can roll almost immediately after your striping crew puts the line down.

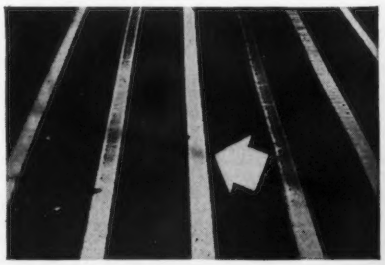
Reflectivity lasts the life of the stripe

High uniformity of reflectivity over every inch of the stripe is an exclusive advantage of pre-mix striping. With "Centerlite" Compound, wherever there is paint there is reflectivity, because the beads are in the paint.

As the stripe slowly wears because of traffic—there is little or no decrease in reflectivity because new beads are constantly exposed. There are no spotty areas, no mottled surface. Uniform reflectivity stays high for the full life of the stripe.

You be the judge

If you want more proof that "Centerlite" pre-mix Reflective Compound is the best buy for your pavement marking dollar, make your own actual service test. Judge "Centerlite" Compound in the company of other striping materials . . . *that's* where it really stands out. Judge for general appearance, color, film condition and reflectivity. Judge for handling and application ease of pre-mix. The facts will show that "Centerlite" Reflective Compound, gives you the *lowest* cost-per-foot, per-day-of-useful life and the *highest* final performance factor. Isn't this the combination you look for in pavement markings?



All lines applied on same day, in same way. Photo taken after 8-month test proves performance of "Centerlite" Compound (arrow).

Your 3M Field Representative or Distributor can supply facts and other information as well as "Centerlite" Compound itself. Ask them for more details, or write to the 3M Company, Dept. 000, St. Paul 6, Minnesota. Or go ahead and enter your order now for that next striping job. You won't be disappointed if you order "Centerlite" Reflective Compound.

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Reference Notes

FATALITIES ON CALIFORNIA FREEWAYS—1955

By G. M. Webb (Mem., ITE) Traffic Engineer and R. J. Israel, Assistant Traffic Engineer, California Division of Highways

Reprinted from *California Highways and Public Works*, November-December, 1956.

DURING the calendar year of 1955 there was a total of 65 fatal accidents, resulting in 81 fatalities, on the 208.22 miles of operating full freeways. Based on 3,061,722,000 vehicle miles of operation, the 1955 fatality rate, full freeway, rural and urban, was 2.65 fatalities per 100 million vehicle miles. This represents a sharp increase from the very favorable rate of 1.92 fatalities per 100 million vehicle miles experienced in 1954.

(The over-all fatality rate for rural state highways in California in 1955 was 8.36 per 100 million vehicle miles.)

Chart No. 1 shows the fatality rates on California full freeways, by years, 1941 through 1955. It may be noted that, although this graph centers about the area representing rates of 2.0 to 2.5, there has been considerable fluctuation in the rate for the individual years. In this respect it may be noted that the 2.65 is not the highest rate of record, nor is the 1954 rate of 1.92 the lowest rate. A study of cyclic fluctuation in this graph indicates a reasonable chance for the rate to again drop in the future.

Expanding Fatalities

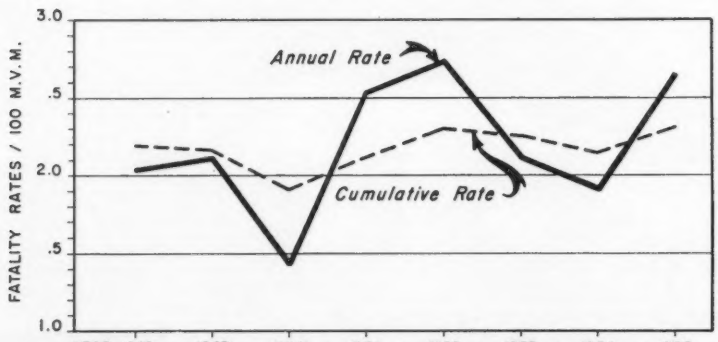
The year 1955 was a year of expanding fatalities nationwide. Since March of 1955, each month has shown an increase over the numbers killed for the month of the prior year on a national basis. It may well be noted that the two major facilities which most closely approached California freeways' fatality rate for 1954 experienced substantial increase in 1955. The fatality rate on the New York State Throughway increased from 2.44 in 1954 to 2.83 in 1955, and the New Jersey Turnpike increased from 2.44 in 1954 to 2.76 in 1955. In spite of the substantial increase in the California rates, it is noted that California's 1955 freeway fatality rate is again lower than these two comparable type eastern facilities.

In addition to the nationwide upswing, there is another important factor involved in California's increased rate. This factor is the expanding mileage of rural full freeways. Whereas, prior records represented primarily urban freeways, the 1955 record is based on 109 miles of rural as compared to 99 miles of urban freeways. The effects of higher speed on rural freeways and their inclusion in mileage subjected to a higher percentage of long-distance travel, resulted in a fatality rate (rural only) of 3.13 fatalities per 100 million vehicle miles as compared to a rate of 2.41 for the urban portion of the system. The building of rural freeways, which is currently progressing at a faster rate than the construction of urban freeways, is expected to exert an increasing upward influence on the basic composite fatality rate.

CHART NO. 1

CALIFORNIA FREEWAYS

Fatality Rates by Years 1941 through 1955



YEAR	1948	1949	1950	1951	1952	1953	1954	1955
Annual M.V.M.	294	378	491	708	986	1274	2034	3062
Cumulative M.V.M. 1941 to Date	548	925	1415	2124	3112	4386	6420	9481

Details of 1955 Freeway Fatal Accidents

Table I, showing basic data on 1955 freeway fatalities, is significant primarily in the fact that 12 of the 65 fatal accidents were pedestrian acci-

TABLE I

BASIC DATA ON 1955 STATE-WIDE RURAL AND URBAN FULL FREEWAY FATALITIES

Number of fatal accidents	65
Persons killed	81
Persons injured in fatal accidents	61
Number of pedestrian accidents	12
Pedestrians killed	13
Total million vehicle miles	3,061.722
Fatalities/100 MVM	2.65

Item	No.	Percent of total
LIGHTING		
Daylight	18	28
Darkness	47	72
No artificial lighting	18	28
From 11 p.m. to 3 a.m.	22	34
Pedestrian accidents:		
Daylight	3	25
Darkness	9	75
No artificial lighting	6	50
WEATHER		
Cloudy or clear	60	92
Raining (1 foggy)	5	8
ELEMENT TYPES		
Single car accidents	40	62
Two or more car accidents	25	38
VEHICLE CONDITION		
No defects	52	80
Defects	2	3
Unknown	11	17
ROADWAY FEATURES		
Curved road	21	32
43 percent of single car accidents are on curved sections		
17 percent of two or more car accidents are on curved sections		
Straight road	43	66
Unclassified	1	2
Level grade	46	71
Up-grade	5	8
Down-grade	8	12
Unknown	7	11

dents involving 13 of the 81 persons killed. This percentage is unduly high considering freeways are fenced and posted for "Motor Vehicles Only." It also represents an extreme increase from 1954 when there were only two pedestrian fatalities on full freeways. In 11 of these accidents causing 11 deaths the pedestrians were on the freeway in violation of the law. Keeping hitchhikers and other pedestrians off the full freeways is an enforcement problem. The increase in number of pedestrian fatalities in 1955 is responsible for a substantial part of the increase in the fatality rate over 1954.

Lighting

Table I also shows light conditions under which freeway fatal accidents occurred in 1955. It may be noted that only 28 percent of the fatal accidents occurred during daylight hours with 72 percent occurring during the hours of darkness. Pedestrian accidents were similarly distributed with 75 percent of pedestrian accidents occurring during darkness. The period from 11 p.m. to 3 a.m., which involved only 5 percent of the vehicle miles, accounted for 34 percent of the fatal accidents on freeways.

Table I shows that 62 percent of the accidents involved a single car, as compared to 38 percent two or more car accidents. Vehicle condition is not an important factor and is specifically noted on only 3 percent of the fatal accidents.

Roadway Features

Under roadway features, also shown in Table I, the majority of accidents as expected occurred on straight road (66 percent) and level grade (71 percent). More significant perhaps is that 32 percent of all fatal accidents and 43 percent of the single car fatal accidents occurred on curves. These percentages of fatal accidents on the relatively small percentage of curve alignment on California freeways should well refute the argument of those who advocate deliberate curvature to reduce monotony.

Fatalities by Type of Accident

Table II shows a breakdown of accidents and fatalities by basic accident types. It may again be seen that single vehicles accounted for 62 percent of the fatal accidents but only 53 percent of the number killed. Overtaking accidents accounted for 24 percent of the fatal accidents and 25 percent of the persons killed. Head-on type accidents, as might be expected, had by far the highest severity with 14 percent of the accidents involving 22 percent of the fatalities and 46 percent of the persons injured in fatal accidents. Although the percentage of head-on fatalities shows a drop from 1954 when one-third of freeway fatalities were due to head-on collisions, the 18 persons killed in such type accidents leaves no room for complacency.

TABLE II

TABULATION OF 1955 FREEWAY FATAL ACCIDENTS BY TYPE AND SEVERITY

Items studied	Approaching No.	Approaching Percent of total	Overtaking No.	Overtaking Percent of total	Single vehicle No.	Single vehicle Percent of total	Total vehicles No.	Total vehicles Percent of all accidents
Accidents	9	14	16	24	40	62	65	100
Persons killed	18	22	20	25	43	53	81	100
Persons killed/accidents	2.0	....	1.25	....	1.1	....	1.2	....
Persons injured	28	46	19	31	21	34	61	100
Persons injured/accidents	3.11	....	1.2	....	0.5	....	0.9	....
Pedestrians killed	0	0	4	31	9	69	13	100

Traffic density on California's highest traffic freeways makes it probable that a crossed median accident will be a head-on and probably fatal. Median guard rails on the heavy volume freeways could probably have prevented the majority of these cross median head-ons. In this respect, it would also have prevented a deliberate attempt to U-turn across the median of the San Bernardino Freeway in the Pomona area which resulted in the death of three young people. This accident is not classed as a head-on since they were run down by a truck in the near inside lane before completing their maneuver.

Driver Condition

Table III shows driver condition and basic causes by type of accident. It may be noted that had-been-drinking drivers were involved in 23 percent of the fatal accidents. Drinking was most significant in the single vehicle and head-on type accidents involving 38 percent and 33 percent of such accidents respectively. Sleepy and asleep drivers involved 11 percent of fatal accidents. More significant was the fact that driver condition was checked as "unknown" or not stated on 37 percent of the accident reports. Of the 24 accidents in which driver condition was not stated by the reporting officer, 11 accidents could probably be classed as involving drinking drivers due to the statements of witnesses and facts surrounding the accident.

Chart No. 2 sets forth graphically the relation between driver condition and hours of occurrence of 1955 fatal accidents on California freeways. The high rate of fatal accidents during the lightest traffic period between 1 a.m. and 3 a.m. is again apparent together with the high percentage of drinking and fall-asleep accidents during the early morning hours. This chart again graphically points out incomplete information with the large areas of unknown or not stated.

Violations

Table III also notes violations by type of accident. Speed is the primary cause of freeway fatalities involving 46 percent of the fatal accidents, with 55 percent of the single vehicle acci-

(Continued on page 299)

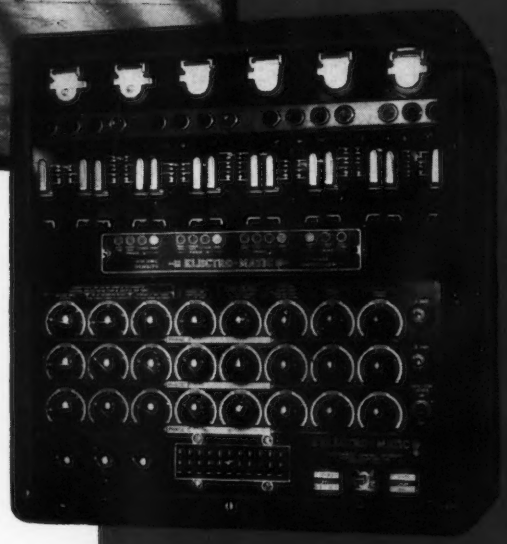
TABLE III

DRIVER CONDITION AND VIOLATIONS INVOLVED IN 1955 FREEWAY FATALITIES

Items studied	Approaching No.	Approaching Percent of type	Overtaking No.	Overtaking Percent of type	Single vehicle No.	Single vehicle Percent of type	Total vehicles No.	Total vehicles Percent of all accidents
Driver condition								
H. B. D.	3	33	2	11	10	38	15	23
Normal	3	33	6	33	9	23	17	26
Sleepy	0	0	2	11	5	13	7	11
Unknown *	3	33	7	39	16	40	24	37
Epileptic	0	0	1	6	0	0	1	2
Causes								
Speed	4	40	4	22	22	55	30	46
Following too closely	0	0	3	17	0	0	3	5
Turning	0	0	4	22	2	5	6	9
Parking	0	0	1	67	0	0	1	2
Changing lanes	6	60	4	22	1	3	10	8

* Eleven additional accidents could reasonably be also H. B. D. due to statements of witnesses, time of accident and facts surrounding the accident.

55,000 Vehicles per day



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OFF-STREET PARKING

(Continued from page 267)

Garrett argued that the collection of increased fees of $120,000 was an abuse of the city's corporate powers, and that the expenditure was unconstitutional if spent for off-street parking facilities.

In upholding the finding of lower courts for the city, the State Supreme Court said:

"The expenditure is not unconstitutional for the reason that the constitution places a limitation only on state-imposed fees, and is not applicable to fees imposed by cities."

The court further held that where fees charged by a municipality for the parking of motor vehicles on and off the streets are not unreasonable in amounts or designed to bring to the municipality revenue other than sufficient to cover the cost and expense of providing necessary parking facilities for such motor vehicles on and off the streets, the charging and collection of such fees will not represent the levy of a tax.

Many new multi-level parking garages will be needed in the heart of Cleveland's downtown section with the completion of a proposed freeway system, it was pointed out by the Cuyahoga County Engineer Albert S. Porter in a recent television interview.

Citing San Francisco and Los Angeles as cities showing the way with parking excavations in central park areas, Porter said extensive space has been made available in those cities without destruction of surface values.

Pennsylvania

A central city parking survey is being conducted in Philadelphia by the engineering firm of Wilbur Smith Associates of New Haven, Conn.

The study is being made for the Philadelphia City Planning Commission at the suggestion of the Urban Traffic and Transportation Board, with the approval of the City Parking Authority and Mayor Richardson Dilworth. It will look into sites for garages and the extent of difficulty of floating bond issues to finance them.

Mayor David L. Lawrence announced plans of the Pittsburgh Parking Authority for construction of a new 700-space parking garage in the city's Golden Triangle.

A number of commercial buildings will have to be cleared to make room for the open-deck, L-shaped parking structure which will occupy part of the block bounded by Ft. Dusquesne Blvd., Sixth St., Penn Ave. and Cecil Place.

The mayor's announcement that construction of the garage would be possible "in the near future" followed the signing of an agreement between the authority and the Joseph Horne Co., which will receive a long-term lease on the facility. The lease will be used to support the sale of revenue bonds to finance land acquisition and construction by the authority.

The garage, now in the preliminary stages of design, will be a continuous floor structure featuring self-parking. Under the lease, the authority will control operational policy and parking rates.

The authority now has five public garages, with a total capacity of 4,000 spaces, in operation in downtown Pittsburgh. It recently announced its intention to build a garage on its lot at Ninth St. and Penn. A 600-space garage for this location, originally planned in 1950, will be redesigned for self-parking. Its construction depends in part on whether the bond market improves.

Wisconsin

Milwaukee's downtown area has 20,000 public parking spaces, according to inventory by the Milwaukee Downtown Association. Of the total parking spaces, about 3,500 are on streets while the others are in off-street parking lots.

"The very substantial number of parking places available was somewhat surprising, even to many downtown business people," said Robert G. Irwin, executive secretary of the association. "They indicate that a better utilization of these facilities, along with a systematic expansion of facilities each year, will keep downtown Milwaukee among the best equipped central districts in the nation."

To help downtown parkers to better utilize the parking facilities, the association is making a new survey which will show the kinds of parking available, the exact locations and the rates charged. Many persons, the association has found, are unaware of available parking sites.

Arthur Buenger, head of the association committee making the new survey, said:

"Our studies have shown us that stores and shopping districts have a common condition in which the working force, with all-day parking needs, is using space which could be more efficiently used by persons with shorter parking needs.

"Downtown, this means that a worker may be paying $15 to $20 a month for parking without realizing that perhaps just a block or two away he could get monthly parking for much less. We are making the survey because we found a real need for a clearing house of information on parking availabilities.

"When we have our information complete, persons with all-day parking needs can find where they can park more cheaply than at present, and the higher priced location will have more room for short term parkers."

Irwin predicted that the development of new parking areas in downtown Milwaukee will be quite steady in the years immediately ahead. Three new lots were opened at E. Michigan and N. Milwaukee Sts., there will be additional clearing of the civic center area and other minor developments will add another 1,000 spaces, he said.

The city is drafting plans for two more parking structures and studying three more structure locations, Irwin said. A civic center plan calls ultimately for underground parking space for 2,500 cars beneath MacArthur Sq.

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FATALITIES ON FREEWAYS

(Continued from page 295)

dents and 40 percent of the head-ons being primarily due to the excessive speed. Speed does not appear as the major factor in total highway accidents and ranks third as a causative violation on total freeway accidents; but for the restrictive class of freeway fatal accidents, a high percentage of which occur in light traffic hours, speed is by far the major violation involved.

Improper turning is involved in 9 percent of the total accidents and 22 percent of the overtaking type accidents. Improper lane changes are involved in only 8 percent of the accidents but are a basic cause of the vehicle going out of control and crossing the median as shown in 60 percent of the head-on accidents.

Conclusions

1. Past experience would indicate that the fatality rate on full freeways may well experience a drop in the next year or two, but the expanding of rural freeways at a faster rate than urban will exert a continuing upward influence on freeway fatality rates.

2. Serious violations are the primary cause of the following two fatal accident categories which contribute very substantially to the freeway fatality rate.

   a. Pedestrian fatalities which involve pedestrians illegally on full freeways.

   b. The high percentage of fatal accidents in the lowest traffic night and early morning hours in which drinking and excessive speed are the predominate causative factors.

3. The number and extreme severity of cross median accidents may indicate a need for a more positive divider on those freeways carrying such high volumes that a median crossing will most probably result in a head-on accident. Further study has been initiated to relate median types to high volume roads.

Fred W. Fisch

Fred W. Fisch, 59, Member of the Institute of Traffic Engineers, died January 29 in Schenectady, N. Y.

Formerly Deputy Superintendent of the New York State Department of Public Works, he had retired in 1954 because of ill health, and was living in Schenectady.

Born in Washington, Fisch graduated from Union College and worked in various city positions before joining the staff of the New York State Department of Public Works in 1946 as Principal Civil Engineer in its newly formed Bureau of Arterial Route Planning. In 1947, he was made Director of the Bureau.

In 1949, the Bureau was absorbed into the Bureau of Highway Planning and he was made first Director.

In 1950 he was promoted to Deputy Superintendent.

During World War I, Fisch served with the Quartermaster Corps in Schenectady and later in sanitation work at Souther Field in Americus, Georgia. During World War II he served as War Transport Administrator for Schenectady County.

In addition to his affiliation with the Institute, Fisch belonged to the American Society of Planning Officials, the National Society of Professional Engineers, the Highway Research Board and the Albany Society of Engineers.

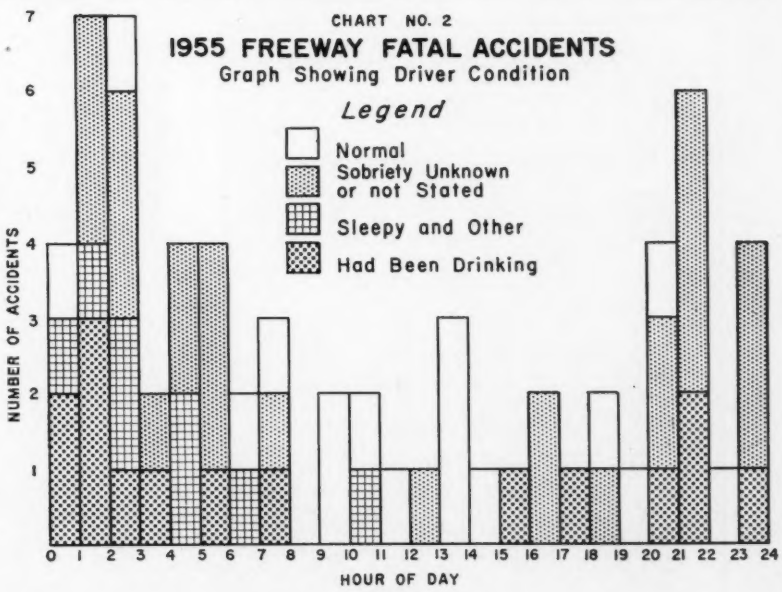
CHART NO. 2
1955 FREEWAY FATAL ACCIDENTS
Graph Showing Driver Condition
Legend
Normal
Sobriety Unknown or not Stated
Sleepy and Other
Had Been Drinking
NUMBER OF ACCIDENTS
0 1 2 3 4 5 6 7
HOUR OF DAY
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

New Members and Transfers

Approved by the Board of Direction, January 5, 1957.

NEW MEMBERS

BOGGS, Henry P. (Associate)
District Traffic & Planning Engineer, Florida State Road Department, DeLand, Florida.

CHRONISTER, Joseph S. (Junior)
City-Parish Traffic Engineer, 307 A Municipal Building, P. O. Box 1471, Baton Rouge, Louisiana.

COCHARO, Sam L. (Junior)
Traffic Engineer, Department of Public Works. SEND MAIL: 2022 East Orman, Pueblo, Colorado.

CONNER, Melvin A. (Member)
Traffic & Planning Engineer, Florida State Road Department, Holland Building, Tallahassee, Florida.

DEEN, Thomas B. (Junior)
Traffic Analyst II, Nashville Traffic Commission. SEND MAIL: 812 Knox Avenue, Nashville, Tennessee.

ESTRIDGE, Jack M. (Junior)
Assistant Traffic Engineer, Quinton Engineers Ltd., 812 West 8th Street, Los Angeles, California.

FIELDS, Kenneth G. (Associate)
Assistant District Traffic Engineer, Indiana State Highway Department, 102 North Senate, Indianapolis, Indiana.

IRELAND, Eugene F. (Associate)
Highway Electrical Engineer, Washington Department of Highways. SEND MAIL: Route 4, Box 176 B, Olympia, Wash.

JONES, Floyd I. (Junior)
Assistant Traffic Control Engineer, Kansas Highway Commission. SEND MAIL: 821 Watson Street, Topeka, Kansas.

KESSLER, Warren L. (Member)
Assistant Traffic Operations Engineer, Illinois Division of Highways. SEND MAIL: 1414 West Ash Street, Springfield, Illinois.

KLINE, Floyd A., Jr. (Junior)
Assistant Traffic Engineer, Indiana State Highway Department, Greenfield. SEND MAIL: 2423 Van Buskirk Road, Anderson, Indiana.

KLOAC, George E. (Junior)
Traffic Engineer II, Bureau of Street Traffic & Parking. SEND MAIL: 1117 West 43rd Street, Chicago, Illinois.

MARKS, Leslie M. (Associate)
Planning & Programming Engineer, U. S. Bureau of Public Roads, Pennsylvania District, Harrisburg. SEND MAIL: 2006 Harvard Avenue, Camp Hill, Pennsylvania.

MIKULICH, Ludwig J. (Associate)
District Traffic Engineer, Michigan State Highway Department. SEND MAIL: 5 Jefferson Court, Saginaw, Michigan.

STREB, Paul L. (Junior)
Assistant State Traffic Engineer, Rhode Island Department of Public Works, 245 State Office Building, Providence 2, Rhode Island.

TAYLOR, Jackson H. (Member)
Project Engineer; Parsons, Brinckerhoff, Hall & MacDonald, New York. SEND MAIL: 14 Barry Road, Scarsdale, N. Y.

TEELE, Ray P. (Affiliate)
Physicist, National Bureau of Standards, Connecticut Avenue at Van Ness Street, N.W., Washington 25, D. C.

THORNTON, Joseph L. (Associate)
District State Aid Engineer, Washington Department of Highways, 6431 Corson Avenue, Seattle 8, Washington.

VARDON, John L. (Junior)
Route Analysis Engineer, Traffic Section, Ontario Department of Highways. SEND MAIL: 171 Clement Avenue, Toronto 12, Ontario, Canada.

VASQUEZ-CABRERA, Julio E. (Junior)
Assistant Chief, Traffic Safety Division, Bureau of Traffic, Department of Public Works. SEND MAIL: 855 Lafayette Street, Stop 1, Santurce, Puerto Rico.

VILLEGAS, George C. (Associate)
Traffic Engineer, DeLeuw, Cather & Company, 1256 Market Street, San Francisco, California.

WOOSTER, David E. (Junior)
Assistant Traffic Engineer, Department of Traffic & Parking, 200 Orange Street, New Haven, Connecticut.

TRANSFERS

BABCOCK, Willard F. (Member)
Professor, Civil Engineering, North Carolina State College, Raleigh, North Carolina.

BAERWALD, John E. (Member)
Assistant Professor, Civil Engineering, University of Illinois, Civil Engineering Hall, Urbana, Illinois.

BARRIERE, Jacques (Associate)
Deputy Director, Montreal Traffic Department, City Hall, Montreal, Quebec, Canada.

BERGSTROM, Donald E. (Associate)
Engineer II, Leadman (Traffic) 526 S. W. Mill Street, Portland, Oregon.

CLINARD, Charles A. (Associate)
Director of Traffic & Planning, P. O. Box 60, Abilene, Texas.

DeNOBLE, Henry M. (Associate)
Director, Planning & Safety, City Hall, Springfield, Missouri.

DESJARDINS, Raymond J. (Associate)
Chief, Transportation Division, Metropolitan Toronto Planning Board, 133 Richmond Street, West Toronto, Ontario, Canada.

FISCH, Arnold G. (Member)
Traffic & Safety Engineer, New York State Thruway Authority. SEND MAIL: 11 West Erie Street, Albany 8, N. Y.

FOWLER, Paul H. (Associate)
Traffic Engineer, San Diego County Road Department. SEND MAIL: 670 Loring Street, San Diego 9, California.

GOVE, A. Wallace (Member)
Traffic Engineer, Bureau of Traffic Engineering, 20 East Worcester Street, Worcester 8, Massachusetts.

HUBER, Matthew J. (Associate)
Research Associate, Yale Bureau of Highway Traffic, 311 Strathcona Hall, New Haven 11, Connecticut.

MARVIN, William L. (Member)
Highway Traffic Engineer III, Metropolitan District Traffic Engineer, Michigan State Highway Department, Detroit. SEND MAIL: 17360 Wiltshire Boulevard, Royal Oaks, Mich.

O'CONNELL, Robert C. (Associate)
Traffic & Planning Engineer, Wyoming Highway Department, State Office Building, Cheyenne, Wyoming.

OSGOOD, Robert W. (Associate)
Traffic Engineer, Oakland County Road Commission, 2420 Pontiac Lake Road, Pontiac, Michigan.

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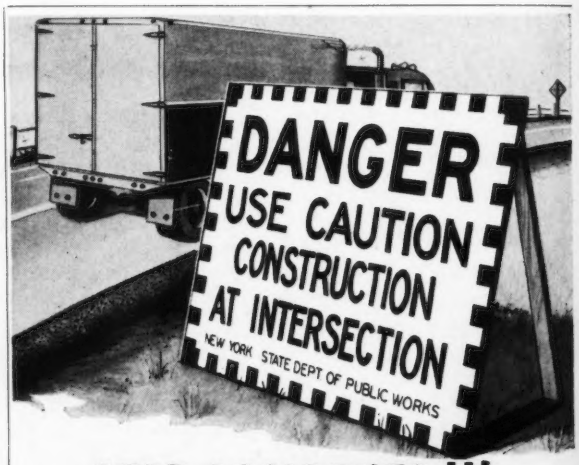

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LETTER TO THE EDITOR

(Continued from page 287)

used, and because it would limit the size of other markers. See Figure 4.

Position also could be used to distinguish interstate markers. For example, a standard method of placement could require that interstate markers be mounted always above and never on the same level with other route markers. See Figure 4.

Conclusions and Recommendations

It is concluded that legend is the most important feature of interstate marking. It is recommended that interstate routes be identified by letters or by adding an "I" prefix to existing route numbers. It is recommended that no new number designations be introduced for the interstate system.

It is further concluded that the shape of the route marker is of secondary importance. It is recommended that the established U.S. shield marker shape be used on the interstate system.

Use of a specific color on interstate markers is not recommended. However, it is suggested that size and position of interstate markers relative to other markers be standardized for the purpose of distinguishing the interstate markers.

ROBERT CONRADT
Asst. Traffic & Safety Director
New Mexico State Highway Dept.

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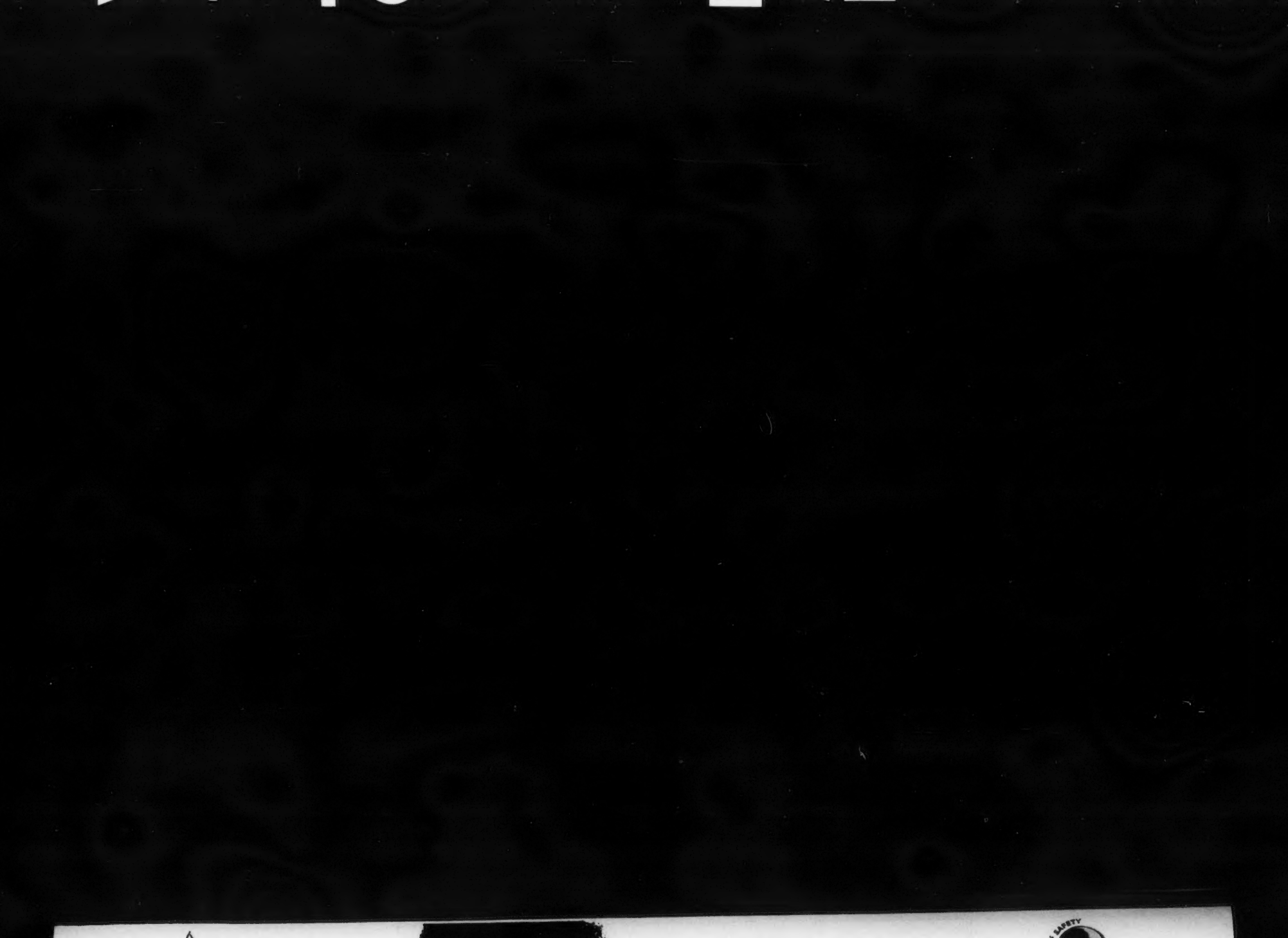
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